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EFFECTS OF THE INHALATION OF ASBESTOS DUST ON THE LUNGS OF ASBESTOS WORKERS

A Preliminary Study

By A. J. LANZA, *Assistant Medical Director*, WILLIAM J. MCCONNELL, *Assistant Medical Director*, and J. WILLIAM FEHNEL, *Chemist, Metropolitan Life Insurance Co.*

INTRODUCTION

In 1929 the Metropolitan Life Insurance Co. was approached by officials representing the asbestos industry in the United States, who were desirous of ascertaining whether asbestos dust was an occupational hazard in their establishments and, if so, what was the nature of this hazard and what should be done to prevent or control it.

About this time several articles had appeared in English medical journals describing a pneumoconiosis due to asbestos dust. While in one or two isolated instances the occurrence of this type of pneumoconiosis had been described in American journals, the industry itself appeared to be quite uninformed of the existence of any such occupational disease.

The hazard of silica dust, with special reference to the lungs, has long been appreciated, and a great deal of study and research has been applied to the problem (in the metal mining and certain other industries) in Great Britain, the United States, the British Dominions, and in other countries. The nature of the effects of silica dust expressed in the term "silicosis", with the resultant extraordinary predisposition to pulmonary tuberculosis, is well known. These effects have been associated with the inhalation of dust containing free silica in varying amounts. The effects upon the pulmonary tissue of dusts containing combined silica—silicates—are still a fertile field for investigation, but evidence is accumulating that certain of these dusts produce pathological results quite distinct from tr e silicosis.

The name "asbestosis" has been applied to the pneumoconiosis caused by asbestos dust and it will be so used in this report. Chemically, the asbestos of commerce is a hydrated magnesium silicate consisting primarily of silica (combined silica) 44.1 percent, magnesia 43 percent, and water 12.9 percent, while ferrous iron and nickel are present in small quantities. This commercial variety of

asbestos most commonly encountered is designated as chrysotile and is one of the four varieties of the mineral serpentine, in which it usually occurs in seams.

It should be borne in mind that silicosis (and presumably asbestosis) develops very slowly, taking from 5 to 15 and even 20 or 25 years to become established. This rate of progress is influenced mainly by the dosage of silica which the lungs receive, and this dosage, in turn, depends upon three variables—the amount of silica in the dust, the quantity of dust in the air, and the length of exposure. Individual idiosyncrasy might be included as a fourth variable; however, little is known of the variations in susceptibility in those exposed to dust. It might well be assumed that similar variables would influence the occurrence of asbestosis.

In places where asbestos is mined or fabricated in North America there does not appear to be present the clear-cut clinical picture which is so unescapable in communities with a true silicosis hazard, such as hard-rock mining communities. It may be that some of the asbestos plants are of too recent origin for the typical effects of a silicate dust to become manifest, but this would not apply to the older mines or to all of the fabricating plants.

The industrial health service of the Metropolitan Life Insurance Co. undertook the following investigation during the period from October 1929 to January 1931, which included:

1. A study of dust conditions in asbestos mines and mills in Canada and in fabricating plants along the Atlantic Seaboard in the United States.

2. Physical examinations of asbestos workers, including X-ray films.

3. A study of dust exhaust systems designed to eliminate asbestos dust.

Data on the fabricating plants only are included in this study and are designated in the report as plants A, B, C, D, and E. This is a preliminary report. A more extensive study of the asbestos industry is now under way.

DUST STUDIES

Apparatus and methods of sampling.—Both the impinger (1) and the electric precipitator (2) were used for the collection of air samples for dusts at the breathing levels and in close proximity to the workmen. Both of these forms of apparatus are adapted for this work, as they are transportable, easily set up and adjusted for the taking of the air samples at the proper level, and are extremely efficient.

The impinger collects the dust by aspirating the air and then impinging it onto a flat surface covered by a liquid in a container. The liquid used was distilled water, containing 50 percent alcohol to

prevent the solution of some of the dusts, particularly any silica which might be present. The impinger was actuated by an electrically driven rotary pump and the rate of air sampled was measured by means of a resistance type of flow meter with an inclined manometer for measuring the pressure difference. Each sample represents the dust collected from a volume of 100 cubic feet of air.

The electric precipitator is designed upon the Cottrell precipitator principle used for recovering dusts and fumes commercially. This principle depends on electrifying the dust particles by making them pass through an electrostatic field and thus causing them to settle out upon a sheet of celluloid. The electrostatic field is set up by means of a transformer operating from the lighting lines on 120 volts, alternating current. Air is drawn through the apparatus by a small rotary fan, run by a motor, the quantity being measured by a flow meter.

Samples of dust brushed from beams and pipe lines near the ceiling also were secured for chemical analysis. All samples were shipped to the industrial hygiene laboratory of the Metropolitan Co., and the dust counts were made according to the methods accepted by the United States Bureau of Mines and the United States Public Health Service (1). Particles in size up to 360 microns in the greatest diameter were counted.

Chemical analyses were made for total (free and combined) silica according to the accepted standard method of Hillebrand (3).

In the first plant studied (A) only particles 10 microns and under in size were counted. It has been demonstrated repeatedly that no silica particles exceeding 10 microns (a micron equals one-millionth part of a meter or one-thousandth part of a millimeter) in greatest diameter enter the lung tissu ; for this reason, the larger particles usually are not considered when determining dust counts. Later, as it appeared from some of the published articles (4) (English) that asbestos particles much larger in size were found in lung tissue, it was decided to count all particles and make differential counts of all those 10 microns and under.[1]

Total particles per cubic foot and the corresponding weight of the dust in milligrams were obtained. Since no relationship between the dust counts and the corresponding weights was found, the weights are not included in the tabulations in this report.

Table 1 shows by plants and by departments the maximum and minimum dust counts in million particles per cubic foot of air. Although the counts in plant A are of particles 10 microns and under,

[1] Samples collected by both the impinger and the electric precipitator were counted. In addition, microphotographs of these dust particles were enlarged by being projected upon a screen with a lantern-slide projector, the enlarged particles being measured with a ruler. Knowing the entire enlargement (by actual measurement), it was easy to calculate the original particle size (5). By the use of Hazen's (6) logarithmic probability paper, the logarithms of the function to be measured (in this case microns) are plotted as ordinates against the probability of occurrence as abscissae.

and in the other plants are for all particles, direct comparison is possible, as in no sample taken were the number of particles 10 microns and under less than 94 percent of the whole.

TABLE 1.—*Maximum and minimum dust counts in million particles per cubic foot of air, by plant and department*

Department	Plant A		Plant B		Plant C		Plant D		Plant E	
	Number of samples taken	Million particles under 10μ per cubic foot of air	Number of samples taken	Million particles per cubic foot of air	Number of samples taken	Million particles per cubic foot of air	Number of samples taken	Million particles per cubic foot of air	Number of samples per cubic foot of air	Million particles per cubic foot of air
Preparation	5	1¼–11½	9	½–8	8	2 –43	------	------	3	30 –82
Card room	8	½–1⅓	5	3½–43¼	6	3½–10½	------	------	3	26 –76
Ring frame spinning room	2	½– 3	------	------	------	------	------	------	------	------
Mule spinning	2	⅓–2½	5	⅓–1	3	1¼– 4½	------	------	3	5½–10
Twisting	10	⅓–1⅓	------	(1)	8	(2) 1 – 3	------	------	3	(1) – 7
Weaving	4	1⁄10–2	4	⅓– 4⅓	6	3⅔–10	15	1 –7	3	10½–19¾
Felt department	6	⅓–44½	------	------	------	------	------	------	------	------
Sheet insulating	3	⅓–4	------	------	------	------	------	------	------	------
Molded brake band and clutch	------	------	------	------	------	------	2	½– 3	------	------

[1] Included in spinning. [2] Includes broad loom weaving.

Whereas the dust in the preparation room is practically all due to asbestos, the contrary is the case in the other departments. In the carding, spinning, and weaving rooms asbestos comprises about 25 percent of the material used. On special jobs the percentage of asbestos may be higher, but in general the figure quoted is approximately correct, the other material consisting principally of cotton. In the insulating departments of plant A, asbestos is but 5 percent of the total material used. In the molded brake-lining and clutch division of plant D, asbestos comprises about 25 percent of the total material. The actual exposure to asbestos dust, therefore, is considerably less than is indicated in the dust counts in table 1.

CONDITIONS IN THE PLANTS

The processes in these plants were very similar to those in cotton mills in general. For illustration, the process in the preparation room of plant B is here detailed at length:

Asbestos is received in bags. These are emptied upon the floor and the asbestos is shoveled into pug mills and run for about 5 minutes in order to crush and open the fibers. From there the asbestos is shoveled into trucks and wheeled to hoppers with either horizontal or vertical openers, similar to those used in textile mills. After passing through the opener, the material is discharged into trucks. Waste manufacturing material is first run through a garnet machine and

discharged into trucks, which are wheeled to the openers, and the material is fed into these in the same manner as is the new material. After being discharged from the opener, the material is put onto a vibrating or shaking screen, where the long fibers are picked off by a suction hood and blown into a bin to be used again in textiles. The short fibers falling through the screen are either sold as such or used in making an asbestos cement.

The cotton is received in bales, opened, and also run through vertical openers. It is discharged into trucks. The filled trucks from the vertical and horizontal openers containing either the asbestos fiber, the cotton, or the waste material are taken to separate storage bins. As needed, these materials are weighed and dumped onto the floor in proportion to the mixture desired, and the resulting mixed materials are then passed through a mixing picker. As this mixture is discharged from the picker, it is sprayed with a light mineral oil. The material is then taken by a mechanical conveyor to the storage bin in the card room. Two of these mixing pickers discharge onto this conveyor system, while a third machine is equipped with a suction device which conveys the material to a storage bin in the card room. The object of the two systems is to facilitate the handling of two grades of material at the same time. The third machine is not equipped with an oil spray. The object of the oil spray is primarily to entrap the small asbestos fibers and hold them enmeshed in the cotton fiber throughout the processes of carding, spinning, and weaving. Incidentally, it is apparent that it also diminishes the amount of dust. The material is saturated with about 4 percent of oil at this point; but by the time it reaches the looms, the oil had diminished to less than 1 percent.

While mineral oil was used in the preparation room of plant C, it apparently was not as efficacious as in plant B. In plant E oil was not used, nor was there any attempt at humidification or any system of dust exhausting. Carding machines were fed by hand. In plant A there was a humidifying, ventilating, and heating system, while plant B depended on natural humidity. In plant E the carding machines were equipped with a dust-exhaust system, but it was not efficiently used. In plant C carding was done in 2 buildings, 1 of which was equipped with an air-conditioning system, and in both buildings the machines had exhaust equipment.

Two plants, B and C, had artificial humidity installations in their spinning rooms. In the former the temperature was 76° F., relative humidity 78 percent. One plant, C, had a humidification system in the twisting department and also in the weaving department, where the relative humidity was 76 percent with a dry-bulb temperature of 69° F., as compared with a relative humidity of 44 percent in the weaving room of plant A.

Aside from plant E, it would appear that the dust hazard was not excessive except in the preparation rooms of plants B and C. The dust counts are interesting, too, when considered in the light of the permissible standard for granite dust, established by the United States Public Health Service (7), namely, about 10 million particles (10 microns and under) per cubic foot. However, we are not justified in assuming that because available information suggests that asbestosis is a milder disease clinically than silicosis, the threshold of permissible dust counts is higher. Asbestosis appears to be pathologically different from silicosis, and the experience so far does not warrant an attempt to define a standard of dustiness for asbestos dust.

DUST CONTROL

Various measures, such as oiling, humidification, and local exhausts, tended to reduce the dust. Nevertheless, it was evident that they were only partly successful. If it is expected to control dustiness in these plants, final reliance must rest upon properly constructed exhaust equipment. In plant C in one department an experimental installation was set up. In spite of some obvious faults, this equipment, on the basis of comparative dust counts, reduced the dust by 50 percent and with further alterations will probably be 75 percent effective. In this case such a reduction seemed quite satisfactory. It is neither practicable nor economically desirable to install such equipment as will make the air entirely dust free. The normal defensive mechanism of the body takes care of a fair amount of atmospheric pollution. It is when the body is exposed to an excessive amount of dust that this defense mechanism breaks down.

The application of exhaust equipment to textile machinery involves considerable difficulty, especially where the construction of the plant is such that it is not possible to apply down-draft suction to the looms.

It is desirable to install exhaust apparatus in any plant on an experimental basis first, and then check its efficiency by dust counts. This practice will result in saving a needless expenditure of money.

PHYSICAL EXAMINATIONS

X-ray films were made of 126 persons (108 men, 18 women) working in asbestos plants in the United States. All but five of these were given physical examination. The cases were selected more or less at random from among those having more than 3 years of employment in the industry. It was soon obvious that the early diagnosis of asbestosis must rest to a large extent on X-ray pictures of the chest. As in the early stages of silicosis, the clinical symptoms of the asbestos workers were usually indefinite and inconclusive. The interpretations of these films are based on the readings of one competent roentgenologist, but they have been reviewed by several

others experienced in this field. The differences of opinion were of a minor nature, and there was general agreement as to interpretation. The films were read conservatively, taking into account the physical examination and the age of the individual, and were classed as positive only when there was no major disagreement. All examiners were guided by their experience in silicosis and other types of pneumoconioses. The films classed as negative for asbestosis were further subdivided into doubtful and negative. Only time can tell whether the individuals classed as doubtful are progressing toward a definite asbestosis. Particular attention was focussed on the presence or absence of indications of tuberculosis, and in this respect all the reviewers of the films were in accord. With the unhappy experience of silicosis in mind, it was felt that a great deal of care should be devoted to ascertaining, if possible, whether or not asbestosis predisposes to tuberculous infection.

The cases of asbestosis were divided into two classes, first stage and second stage. The first stage embraces those who show by X-ray examination definite lung pathology sufficient in extent to warrant a diagnosis of pneumoconiosis, but who have no definite symptoms. The second-stage cases exhibit more extensive lung pathology and also definite symptoms.

All these individuals [2] were actively engaged in factory work, and it was not practicable to make any distinction on the basis of working ability or disability. Had any individuals been found who exhibited extensive pulmonary involvement and marked physical disability or total disability, they would have been classified as third stage, but no such cases were found.

Of the total of 126 X-ray examinations, 4 were diagnosed as second-degree asbestosis, 63 as first degree, 39 as doubtful, and 20 as negative.

There is a definite increase in the percentage diagnosed as positive in relation to the years of exposure, as shown in table 2. Small numbers make it impossible to determine how far the factor of age enters into this increase.

TABLE 2.—*Classification of cases by years of exposure*

Years of exposure	Percentage positive	Number		
		Positive	Doubtful	Negative
Over 15 years	87	13	[1] 1	[2] 3
10 to 15 years	58	7	3	2
5 to 10 years	50	30	25	3
Under 5 years	43	17	10	12
Total examined		67	39	20

[1] Part time [2] 1 not continuous.

[2] One asbestos worker (second stage) retired of his own accord, because of old age, 10 years previous to this study, but is still active about his garden.

Of the 64 persons given physical examination and diagnosed as having positive asbestosis, only 8 were entirely free from symptoms, while 10 out of 37 with doubtful and 7 out of 20 with negative diagnoses were free from symptoms. Dyspnoea and cough were the symptoms most complained of, but none of these cases exhibited the urgent or evident type of "short wind" seen in true silicosis. Several of those classed as negative stated that they were "short winded" and were so recorded, but too much emphasis should not be placed on statements of subjective symptoms. During the progress of the study, physicians who were practicing in the communities where asbestos workers lived were questioned and stated that they did not find an unusual amount of tuberculosis among these workers. The contrast between this state of affairs and that found in a community with a silicosis hazard is noteworthy.

The incidence of tuberculosis (based upon X-ray films) is given in table 3; 40 of the 67 examined had less than 15 years of employment in the industry.

TABLE 3.—*Incidence of tuberculosis*

	Positive	Doubtful	Negative
Tuberculosis (healed)	7	1	2
Tuberculosis (active)	[1] 1	0	1
Total examined	67	39	20

[1] This case was diagnosed as probably active on the X-ray findings.

Table 4 gives information as to physical signs of chest trouble.

TABLE 4.—*Chest findings*

	Positive	Doubtful	Negative
Physical signs of chest trouble	[1] 33	[2] 9	[3] 7
No physical signs	31	28	13
Not examined	3	2	0
Total	67	39	20

[1] At least 6 of these showed no evidence associated with asbestosis.
[2] [illegible] of these not associated with usual signs found with asbestosis.
[3] 6 of these not associated with usual signs of asbestosis.

What significance, if any, can be attached to the presence of "asbestos corns" on the hands of workers appears doubtful, as 18 percent of the positives (12 out of 64) and 15 percent of the others (doubtful, 7 out of 37, negative, 2 out of 20) showed such corns.

Each roentgenologist who reviewed the X-ray films called attention to the fact that these films indicated a very unusual incidence of enlargement of the heart. It is probable that this is a compensatory enlargement due to the additional work put upon the heart in efforts

to pump blood through the fibrosed lungs. It is possible that not sufficient attention has been paid to the effects of the pneumoconioses upon the heart.

Many workers had changed from one department to another and from one plant to another during their years of employment in the asbestos industry. Since only the amounts of dust collected at the time of this survey in the various departments are known, there is no way of knowing the average amount of dust in the atmosphere inhaled by these people over the years of their employment. Consequently, it is not possible to correlate individual cases with definite amounts of dust exposure.

INSURANCE CLAIMS

To throw light on the relationship between asbestosis and pulmonary tuberculosis, an analysis of death claims and total and permanent disability claims was made in regard to companies carrying group insurance and having available figures.

There were 2,099 lives involved, with a total exposure of 7,019 life-years. The death claims are so small in number that reliable conclusions cannot be reached from any subdivision of the figures. The same is true of the sickness claims under health insurance. The number of claims for respiratory diseases is high in two of the plants studied but low for the others, as compared with the Metropolitan experience of 1927. However, during the latter part of 1928 and the first part of 1929 there was an epidemic of influenza.

The records of one establishment (plant B) showed that 6 of 36 death claims and 8 of 10 permanent and total disability claims were listed as due to pulmonary tuberculosis. This appeared to be an inordinate amount of tuberculosis from this plant. However, many of the employees were Negroes, and also tuberculosis claims are generally high in this section of the country. Realizing the difficulty in diagnosing pneumoconiosis and the tendency to confuse it with tuberculosis, these claims were studied individually. The physicians who had treated the individuals were interviewed, and the hospital and sanatorium records, including available X-ray films, were investigated, with the following results:

Death claims:

1. A typist, not exposed to dust; died of pulmonary and intestinal tuberculosis.

2. Colored male, age 27; worked in asbestos 1 year and 8 months; died of pulmonary tuberculosis following a hemorrhage; was in sanatorium 10 months. Also had a four plus Wassermann. No evidence of asbestosis.

3. Colored male, age 32; worked in asbestos plant 1 year and 7 months; died of pulmonary tuberculosis after 1 month in hospital. Cavitation both lungs; no evidence of asbestosis.

4. Colored male, age 34; worked in asbestos plant 2 years and 6 months. His physician believes this was a case of uncomplicated tuberculosis. Was not inmate of hospital or sanatorium. No information could be obtained on the other two cases.

Total and permanent disability claims:

1. Male, employed in asbestos plant 3 years. His physician states that he first came under his observation with an old established case of tuberculosis about 2 years after asbestos employment started. Also had tuberculosis of the kidney and cervical glands.

2. Male, employed in asbestos plant 8 months. His physician states finding of old fibroid tuberculosis with tubercle bacilli in sputum. No X-ray available; but according to physician, asbestos bodies were found in sputum.

3. Male, 10 years' employment. Two physicians who treated him at different times are now inclined to believe this man is not tuberculous, but has asbestosis.

4. White male, was reexamined at time of investigation. His physician reports well nourished, husky looking, good color, no cyanosis; no clubbing of fingers; diminished expansion; incessant cough; X-ray shows fine mottling disseminated through both lungs. No evidence of tuberculosis. Probably a second stage asbestosis.

5. White male, 13 years in asbestos plant. Is now in sanatorium. An interesting case. His physician states that he has extensive asbestosis and pulmonary tuberculosis; cavity in right lung; sputum loaded with tubercle bacilli and asbestos bodies; believes tuberculosis long antedated asbestosis. This patient is progressing in a satisfactory manner.

It was not possible to locate the other three cases of total and permanent disability who had been diagnosed as having pulmonary tuberculosis. On the basis of the information obtained, the deaths in death-claims cases appear to be due to uncomplicated tuberculosis; three of them were Negroes, who were probably tuberculous at the time their employment in the asbestos plant commenced.

Of the 8 disability claim cases, 1 was uncomplicated tuberculosis and 2 were uncomplicated asbestosis who were put on disability because of a mistaken diagnosis of tuberculosis. In this same community we know of one death due to uncomplicated asbestosis in an individual with many years' employment in the industry.[3]

CONCLUSIONS

1. Prolonged exposure to asbestos dust caused a pulmonary fibrosis of a type different from silicosis and demonstrable on X-ray films. Clinically, from this study, it appears to be of a type milder than silicosis.

2. Cases of definite cardiac enlargement were frequently found to be associated with asbestosis.

[3] Personal communication

3. A predisposition to tuberculosis due to asbestos dust was not indicated in this study.

4. Asbestosis as observed in this series of cases had not resulted in marked disability in any case.

5. It is not known how much asbestosis may add to the mortality of pneumonia and acute nontuberculous pulmonary infections.

6. It is not practicable as yet to establish standards for the asbestos dust content of air.

7. The amount of dust in the air in the asbestos plants studied can be substantially reduced.

RECOMMENDATIONS

It is recommended—

1. That the industry seriously face the problem of dust control in asbestos plants.

2. That new employees be examined physically, including X-ray examination of the chest, and rejected for employment if they show tuberculosis or pneumoconiosis.

3. That employees be examined physically, preferably every year, but at least every 2 years, this examination to include an X-ray examination of the chest.

4. That the industry sponsor studies on known cases of asbestosis, as well as studies on effects of asbestosis on the heart and circulation.

ACKNOWLEDGMENTS

The authors wish to express their sincere thanks to all those who aided in making this study possible, especially the officials and employees of the asbestos companies who cooperated to the fullest extent and gave every facility for securing data; also to Dr. Pancoast, of the University of Pennsylvania, for his interest and valuable advice in interpreting X-ray films, and to Dr. F. V. Meriwether, of the United States Public Health Service, surgeon in charge of the United States Bureau of Mines Cooperative Clinic in Picher, Okla., whose interpretation of all the X-ray films listed in this report is followed. Appreciation is also expressed to Dr. W. Atmar Smith, and Dr. Kenneth Lynch, of Charleston, S. C., for information and advice, particularly as to the pathology of asbestosis;[4] to Dr. W. W. Wild, of Charleston, S. C.; to Dr. Joseph H. Wyatt, of Newark, N. J., and Dr. H. H. Fellows, of New York, for assisting in interpreting X-ray films; to Dr. Paul O. Snoke, of Lancaster, Pa.; to Dr. R. H. Stevenson, of Danville, Quebec, Canada; and to Dr. L. U. Gardner and Mr. Donald E. Cummings, of the Saranac Laboratory, who have undertaken the study of the pathological effects of the inhalation of asbestos dust

[4] Asbestosis bodies in sputum and lung. By Kenneth M Lynch, M. D., and W. Atmar Smith, M. D. Jour. Am. Med. Assoc, Aug. 30, 1930, vol 95, no 9, pp. 659–661.

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ENDEMIC TYPHUS IN ALABAMA[1]

By J. N. Baker, M. D., James G. McAlpine, Ph. D., and D. G. Gill, M. D., D. P. H., *Alabama State Department of Health, Montgomery, Ala.*

I. INTRODUCTION

In a preliminary report made in June of this year before the Conference of State and Provincial Health Authorities, held in Washington, the authors discussed the epidemiological aspects of endemic typhus as it occurs in southern United States. In that report it was noted that there had been a rapid increase in this disease in certain Southern States, as is shown in table 1. That other countries have experienced a similar rise in incidence is evidenced by the figures in table 2.

The distinction between epidemic typhus and the endemic typhus of this country was first recognized in 1898 by Brill. He (1) found in the United States a type of fever which, resembling typhoid, gave a negative Widal reaction. In further studies he (2, 3) demonstrated its similarity to typhus, but showed that it was milder in character and less contagious, only one case as a rule being found in a household. Also he reported that it was most prevalent during the fall of the year instead of late winter or spring. In 1912 Anderson and Goldberger (4) proved that Brill's disease was immunologically identical with Mexican typhus, or tabardillo. Naturally this led to the belief that it was louse borne.

[1] Read before the laboratory section of the American Public Health Association, Pasadena, Calif., Sept. 3, 1934.

TABLE 1.—*Typhus fever incidence in Southern States, 1928–July 1, 1934*

State	1928	1929	1930	1931	1932	1933	1934
Florida	49	48	[illegible]	28	42	54	11
Georgia	48	37	134	127	[illegible]	[illegible]	156
Alabama	59	72	67	80	237	823	112
Louisiana	0	1	0	1	17	11	4
Texas	5	8	13	43	227	365	146

[1] 6 months only, to July 1.

TABLE 2.—*Incidence of typhus fever in certain countries*[1]

Country	1928	1929	1930	1931	1932	1933
Egypt	599	1,141	288	265	2,298	7,939
Union of South Africa	1,433	1,778	1,347	[illegible]	[illegible]	[illegible]
Mexico [2]	516	741	894	1,654	1,246	[illegible]
United States	196	239	510	374	592	1,668
Poland	2,401	1,988	1,610	2,154	2,253	2,842
Rumania	983	1,456	1,857	1,419	1,758	1,971

[1] From the Epidemiological Report, Health Section, League of Nations.
[2] Deaths
[3] For 6 months.

Nevertheless, Maxcy (5) (1926), in an extensive epidemiological study of Brill's disease, or endemic typhus, was at a loss to explain its noncontagious character and its seasonal incidence if he assumed that the louse was the vector. Since he noticed that a larger number of cases appeared among persons handling foodstuffs, he was inclined to believe that rats and mice might be the reservoirs, and that the disease was carried to man by fleas, mites, or ticks. Furthermore, he emphasized the fact that Brill's disease shows no preference for the lower strata of society and bears no relation to lousiness. The next step was taken when Dyer, Rumreich, and Badger (6) (1931) were able to recover the virus of Brill's disease from rat fleas which had been found in typhus foci.

Rumreich (7) (1933) has pointed out that until 1931 "there was, in spite of Maxcy's fundamental work, much confusion in regard to the probable vector of endemic typhus, and a variety of insects and arachnids were suspected by different workers. Among these vectors were the tropical rat mite, common North American chigger, the body louse, the head louse, the *Anopheles* mosquito, the bedbug, and the tick. It is now obvious that much of this chaos was due to the fact that two distinct clinical entities were being confused, and for this reason Maxcy's observations were not more widely accepted." The work of Rumreich, Dyer, and Badger (8) (1931) definitely proved that there are in eastern and southern United States two diseases which are related both etiologically and serologically. One of these is endemic typhus, which is transmitted to man by the rat flea; the other is Rocky Mountain spotted fever, which is carried by the tick.

II. ENDEMIC TYPHUS IN ALABAMA

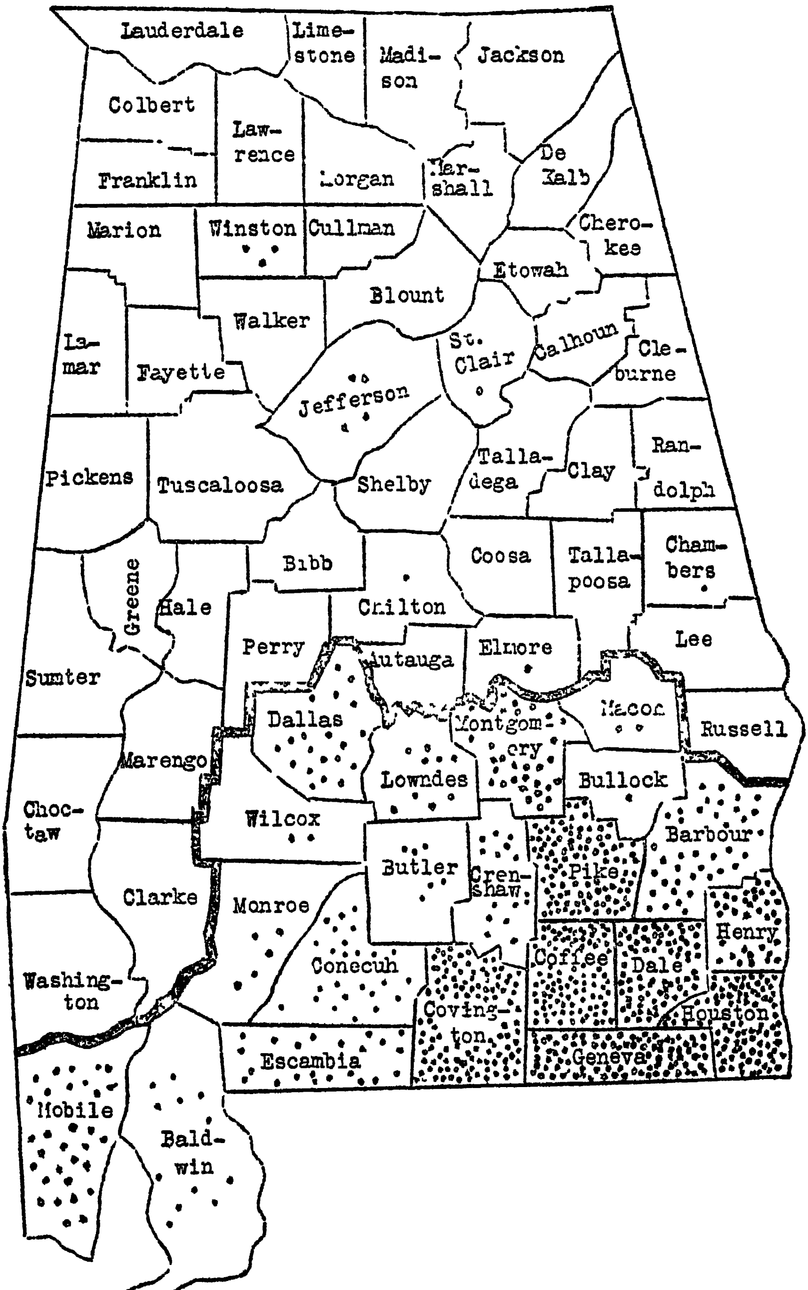
Typhus fever was first recognized in Alabama in 1922, when a series of cases giving a positive Weil-Felix reaction were reported by Maxcy and Havens (9). From that time until 1932, cases continued to be reported, with an average of 60 to 80 cases being recognized each year. The disease has been confined almost exclusively to south and southeast Alabama, with certain localities showing cases year after year. In 1932 there was a very sharp increase in incidence, there being 237 cases with 11 deaths as compared to 80 cases and 4 deaths in the preceding year. This increase continued during 1933, when the number of cases totaled 823 and the deaths 35. Figure 1 shows the location of the cases reported during 1933. From the urban centers the disease has spread until much of the incidence is now in purely rural areas and among people who could not have obtained their infection except at home. Rumreich (10) has reported evidence indicating that several species of rodents may be concerned in the problem of rural typhus. Association with food establishments is still an important factor in urban cases.

The seasonal occurrence has remained constant during all this time, with the summer and fall months accounting for most of the cases. This is, of course, contrary to the experience with the epidemic type of the disease. In table 3 the cases by months for 8½ years are given.

TABLE 3.—*Seasonal distribution of cases in Alabama, 1926–33 and January–July, 1934*

Year	Jan.	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct.	Nov.	Dec.
1926	4	1	1	2	3	3	1	5	7	7	4	10
1927	6	1	2	1	1	5	9	7	11	7	8	8
1928	1	2	1	0	0	7	9	12	13	2	4	8
1929	0	3	4	5	4	7	4	11	11	5	12	6
1930	1	2	1	0	6	5	3	11	19	10	6	3
1931	3	2	1	6	1	4	7	12	5	15	13	11
1932	6	3	5	12	9	29	17	26	51	48	17	14
1933	11	8	16	15	39	79	153	129	149	75	92	59
Total	32	22	31	41	63	139	203	213	267	169	156	119
1934	27	36	19	7	11	18	24					

Maxcy (5) called attention to the relative freedom of the Negro from the infection. This still holds true, but not to the same extent, since there have been 77 cases reported among the colored in the past 2 years. In the 21 counties most concerned, the Negro population is 45 percent of the total, so that the attack rate among them is only one-tenth that of the white. Males continue to predominate, particularly among the whites, and adults again are most affected. With the extension of the disease into rural areas, however, and with the infection being acquired at home, more women and children are being exposed. Table 4 shows the distribution of 1,029 cases reported during 1932 and 1933 in which race, sex, and age were given.



• Indicates case of Typhus Fever.

FIGURE 1.—Typhus fever in Alabama, 1933

TABLE 4.—*Distribution of 1,029 cases of typhus fever, by race, sex, and age, in Alabama, 1932–33*

Age (years)	White		Colored		Total	
	Male	Female	Male	Female	Male	Female
0–4	4	10	0	0	4	10
5–9	20	15	1	1	21	16
10–14	43	31	2	2	45	33
15–19	67	24	3	0	70	24
20–24	46	26	1	4	47	30
25–34	105	51	10	11	115	62
35–44	117	52	7	3	124	55
45–54	74	46	8	4	82	50
55–64	42	20	4	2	46	22
65–74	21	11	0	1	21	12
75 and over	3	2	0	0	3	2
Not stated	66	56	9	4	75	60
Total	608	344	45	32	653	376

During 1932 and 1933 there were reported 46 deaths from typhus fever. Based on 1,029 cases reported for these years, this is a case fatality rate of 4.4 percent, an annual death rate of 0.84 per 100,000 population. This fatality rate of 4.4 percent for the cases reported in 1932 and 1933 is lower than the rate for cases reported prior to this period. In the 498 cases reported since the recognition of the disease in 1922, through 1931, there were 38 deaths, or a fatality rate of 7.6. No doubt the morbidity from this disease was reported more completely during the last 2 years and is a partial explanation of the decrease in the fatality rate. It is apparent that there has been no increase in the fatality of the disease with its increased incidence.

Whereas 73 percent of the cases of typhus in Alabama in the last 2 years were under 45 years of age, only 35 percent of the deaths were less than 45 years of age. As shown in table 5, the fatality rate varied greatly with age, being less than 2 percent for cases under 45 years, 5 to 7 percent for cases occurring between the ages of 45 and 64 years, and approximately 30 percent for persons above 65 years of age.

TABLE 5.—*Case fatality of typhus fever in Alabama (based on 1,029 cases), 1932–33*

Age (years)	Cases [1]				Deaths				Deaths per 100 cases			
	White		Colored		White		Colored		White		Colored	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
0–14	75	67	4	4	1	1	1	------	1.3	1.5	([2])	([2])
15–44	376	183	26	20	7	2	4	------	1.9	1.1	([2])	([2])
45–64	130	79	15	7	9	4	1	2	6.9	5.1	([2])	([2])
65 and over	27	15	0	1	8	5	1	----	29.6	33.3	([2])	([2])
All ages	608	344	45	32	25	12	7	2	4.1	3.5	15.5	6.3

[1] Unspecified ages distributed.
[2] Number of cases too small to make significant rates.

These conclusions are based on the fatality rate for white cases, since the number of colored cases, by age, was too small to warrant analysis. The fatality rate for the colored cases was 11.7 percent, as against a fatality rate of only 3 8 for whites. That the higher fatality rate for Negroes may be due, to a considerable extent, to less complete recognition and registration of cases for this group is quite possible.

It should be noted that, when two or more causes, including typhus, are stated on the death certificate, typhus fever is preferred over all other causes except cholera, plague, yellow fever, and deaths from violence. A study of the death certificates for these deaths reveals that on only 11 of them was typhus fever the only cause given. The most frequent contributory cause was pneumonia, in 14 instances, nephritis in 9, myocarditis in 6, apoplexy in 4, and all other causes, 8. In some instances more than one of these conditions were noted on the death certificate. A contributing factor to this higher fatality in persons of older ages is the fact that these persons were already suffering from a chronic heart or nephritic condition which would have made them poor risks for any infectious disease. In uncomplicated cases the case fatality rate for endemic typhus is low.

III. DIAGNOSIS

A. CLINICAL

These cases were seen by a wide variety of physicians, but the clinical appearance was sufficiently characteristic in most instances to be readily recognized.

The occurrence of cases with fever, usually lasting 2 weeks, and complaints of headache, dizziness, anorexia, and prostration, and accompanied by a rash, are very suggestive. The rash, which is the most characteristic finding, appears about the fifth day, usually on the chest and abdomen and on the medial surface of the arms. It may not extend further or may spread and involve the whole body; the face, palms, and soles are not usually involved. In character it usually consists of rose or dark red macules fading into the surrounding area. The macules do not disappear on pressure, but the whole rash lasts from 2 to 10 days, when it rapidly disappears.

The differential diagnosis must include typhoid fever, malaria, dengue, and Rocky Mountain spotted fever. Laboratory procedures will assist in removing the first three, but spotted fever can be eliminated only on clinical and epidemiological grounds. In Rocky Mountain spotted fever the clinical course is more severe and the rash more profuse. There often is also a history of tick bite and sometimes a small ulcer at the site of this bite.

B. LABORATORY

During 1933 the laboratories of the State health department examined 1,445 specimens, of which 431 were positive for the Weil-Felix reaction, while an additional 81 were classed as doubtful. This compares with 149 positive tests in 1932, 63 in 1931, and 61 in 1930.

The Weil-Felix reaction, or the agglutination of *proteus* X_{19} by the serum of the suspected case, has proved of inestimable value in the practical diagnosis of epidemic typhus. Numerous experiments have shown the high specificity of this test. In endemic typhus, Brill and Roehr (11) (1929) reported disappointing results from its use, but Dyer (12) (1933) states that "the blood serum contains agglutinins for *proteus* X_{19} in dilutions of 1:160 or more in nearly all cases. The highest titer is usually reached at the end of the second week and may reach a dilution of 1:40,000." Cases occurring in Alabama almost invariably show a strongly positive Weil-Felix reaction, most of them exhibiting a complete agglutination in the 1:640 dilution, which is the highest one used routinely. Sera which agglutinate only in the 1:80 are considered doubtful and second specimens are requested. Those which give reactions in the 1:160 or above are called positive. It has been stated that, in epidemic typhus, the agglutinins rapidly decline during convalescence and disappear almost entirely after 5 months. In a few cases of endemic typhus, which have been observed for long periods at this laboratory, the titers gradually declined but agglutinins were present in appreciable quantities even after 6 months.

From the laboratory standpoint the differential diagnosis between spotted fever and endemic typhus is most difficult. Both diseases give the Weil-Felix reaction, although there are some variations with different strains of *proteus* X. Attempts have been made to use this as a means of separation, but as yet sufficient data have not been accumulated. The total leucocyte count is of some value, because in endemic typhus it usually falls within normal limits or there may be a leucopenia, while in Rocky Mountain spotted fever a leucocytosis is generally present. Several cases of endemic typhus occurring in Montgomery recently have exhibited increased white cell counts.

Dyer (12) has stated that "for the laboratory identification of a virus suspected of being either typhus or spotted fever the study of the effect of the virus on laboratory animals is essential. The points to be observed are (1) the clinical picture produced in guinea pigs, (2) the production of agglutinins to *proteus* X in rabbits or monkeys, (3) the presence of the typical histologic picture in the brains of animals, and (4) cross-immunity tests." Since this involves a large number of animals, and a great expenditure of labor and time, it is impracticable as a routine measure. This procedure has been described in detail by Badger (13) (1933).

A number of cases of typhoid fever which were confirmed by blood cultures were also found to have positive Weil-Felix reactions in fairly high dilutions which increased in titer as the disease progressed. In these patients there was no evidence of mixed infection. One explanation is the possibility of a previous attack of endemic typhus. The chance of wrong diagnosis in such cases on which the Weil-Felix reaction alone is requested is apparent. This observation has been made sufficiently often in our laboratories to justify the routine culture of all bloods submitted for the agglutination reaction in order to arrive at the proper diagnosis of undiagnosed fevers. Specimens of blood received at the laboratories from those sections of Alabama where endemic typhus is prevalent are routinely subjected to the Weil-Felix test, in addition to what other information might be requested by the physician in attendance.

IV. CONTROL

During the past 2 years the disease reached such proportions that it became a serious public health problem. The definite incrimination of the rat and rat-flea as the source of infection naturally pointed to rat destruction as the most feasible means of attack. The area of Alabama most seriously infected corresponds roughly to the peanut-growing area, so that the rat population was probably very high. During 1933 many of the towns in the area concerned inaugurated rat-control programs, combining poisoning and trapping in most instances. With the inauguration of the Civil Works Administration project a larger, more widespread program superseded the local efforts, and a serious attempt at rat destruction was undertaken in some 21 counties. It is estimated by the Biological Survey that almost 4,000,000 rats were destroyed in this project, which closed with the discontinuance of the Civil Works Administration program.

There has been a remarkable decrease in typhus cases in Alabama since the rat-control campaign. There were 81 cases in 1931, 237 cases in 1932, 823 cases in 1933, and 75 cases between January 1 and March 10, 1934, as compared with 24 cases for the same period of 1933. Thus, from 1931 to the time the rat campaign was conducted in January, February, and early March, 1934, there was an almost constant increase of 300 percent each year over the preceding year. From March 11 to July 28, 1934, there have been only 60 typhus cases as compared with 288 for the same period last year, or, since the campaign, a decrease of 79 percent in place of a 300-percent increase. The evidence is now strong that rat control is an important factor in the suppression of this disease.

V. CONCLUSIONS

Endemic typhus fever, or Brill's disease, has, during the past 2 years, become a serious problem in Alabama and some other southern States. From foci in certain cities the disease has spread to rural areas and is now widespread.

The original observations of Maxcy as to race, sex, age, and seasonal distribution have been largely confirmed.

The case fatality rate for uncomplicated endemic typhus is low. Much of the mortality is in the older age groups. There has not been an increase in case mortality rates with the increasing morbidity.

The work of Maxcy (5) and of Dyer, Rumreich, and Badger (6) has shown that the reservoir of infection is in the rat and that transmission is by the rat flea. The mild winter climate, plentiful food supply, and absence of ratproofing in buildings are all conducive to heavy rat infestation.

Rat eradication is evidently an important factor in the control of this disease.

The Weil-Felix reaction has proved to be of inestimable value in the diagnosis of endemic typhus.

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THE EDUCATOR'S VIEWPOINT OF PSYCHIATRIC SERVICE IN A PENAL INSTITUTION [1]

By R. A. McGee, *Supervisor of Education, United States Northeastern Penitentiary, Lewisburg, Pa.*

By way of introduction and orientation, a brief statement of the educator's relationship to the other elements contributing to a program such as that outlined by the Chillicothe staff [2] seems appropriate.

Criminal behavior is always a result of personal factors and a social situation. The psychiatrist and the psychologist are concerned chiefly with the personal or individual side of this problem. The social worker is interested in its situational aspects. The educator's task is that of bringing about certain changes in individuals in order that they may make more satisfactory adjustments to their particular socio-economic situations. Since his work is with individual men, he finds himself somewhat more closely related to the psychiatric service than to other departments in the institution. However, the formal educational unit is not the only agency attempting to bring about individual improvement. The majority of the entire staff is charged with this duty. The medical group, the disciplinary officers, the chaplains, and the industrial units should be equally interested. In view of the fact that all of these changes or improvements except the organic ones involve learning, the educator has more reason than idle curiosity for a professional interest in all of the activities of the institution. Aside from a mere segregation of incorrigibles, a prison in its last analysis is an educational institution. This implies a broader definition of education than the imparting of information and skill. Learning regular habits of work, to brush the teeth, and to take a daily bath are as truly educational as learning long division or plumbing, and in many cases are far more significant.

[1] Presented at the Conference on Medical and Psychiatric Services of the Federal Penal and Correctional System, held at Springfield, Mo., Sept. 13–15, 1934.
[2] The role, organization, and function of psychiatric service in a correctional institution. By Hagerman, Dyer, and Limburg. Pub. Health Rep., Nov 9, 1934, p. 1325.

The prison educator therefore conceives of himself as a unit in a larger program of human regeneration. He cannot function except by complete cooperation and coordination with all other units. The means of promoting certain phases of this cooperative effort constitute the essence of this paper.

The cornerstone of cooperative enterprise is mutual understanding and a common objective. Workers in penal institutions tend to confine their activities to their respective specialties. Each department head jealously guards his own prerogatives and almost dares anyone else to claim any knowledge of his field. Each confuses the other by a polite barrage of technical terminology. Each is inclined to attach more importance to his own findings than to those of his associates. There often seems to be a lack of mutual understanding as to ultimate objectives which is essential to a proper balancing of values and the development of an integrated program.

As a first step in this direction it is suggested that we develop a common language—else how are we to understand one another? It seems entirely reasonable to believe that this could be accomplished if each of the members of the warden's official family would prepare a list of terms used by him in his official relationships, giving definitions and explanations, with the implications to be drawn from each. Then let us hold periodical meetings in each institution, at each of which some staff specialist would explain in laymans' language some phase of his work, with the proper development of terms and ideas. He should be frank to say in which instances his findings might be interpreted by nonspecialists, and in which action should be taken on a basis of expert interpretation only. The fact that one officer knows something of another's business need not result in his assuming the responsibilities of the other and such knowledge would certainly contribute to a closer cooperative relationship.

As a second step, it seems that some formal effort to balance conflicting values brought to light in the classification and assignment board meetings would be most beneficial. It is true that this is a matter of administrative policy, but careful and expert thought should contribute to the formulation thereof. How much weight should the deputy warden attach to a diagnosis of feeble-mindedness? How much to the educator's recommendation that vocational training is the most vital factor in rehabilitation in a given case? How much to the fact that a man's family is destitute? How much to a wide discrepancy between educational and mental ratings? How much to an inmate's criminal history? How much to the immediate needs of the institution? And so on. Each man's case must be decided on its own merits—that is the reason for the Classification and Assignment Board meetings. But, on the other hand, it is undoubtedly

true that a general formulation of policies would serve to expedite and clarify the individual problems of institutional treatment.

The development of the Classification and Assignment Board has been a longer step than many of us realize toward a cooperative administration. This device brings about an interplay of ideas which is of great value. However, it seems to me that the board has been given an inappropriate name. Classification does not harmonize with the concept of individual treatment, and the element of assignment is already overemphasized in comparison with other problems of adjustment. The name "case board" or "program committee" might be more in keeping with its functions.

Experience with this board at Lewisburg makes me fear that its work will degenerate into such a routinized procedure that it will lose its real values for no better reason than the fact of its having a greater volume of work to do than is possible if the staff members are to handle their other work efficiently. To meet on all new cases, to follow up on special cases, to advise on difficult disciplinary cases, and to administer a merit system would require a conscientious board to meet at least three half-days per week. Some speedier system must be devised. This necessarily involves the selection of special cases for intensive and individual work, and the handling of others in a more perfunctory manner.

A majority of inmates will derive what good can be obtained from the institutional program without much individual attention. Others should be tagged as problem cases as soon as they can be identified. These should be reconsidered by the board and by the individual staff members at regular intervals. Follow-up work, to be effective, must be organized and the cases initiated by the staff; otherwise the time available to devote to individual cases will be consumed to a large degree by the psycho-neurotics and other constitutional pests, with the result that many other deserving cases will go entirely without attention.

This necessity for selective handling of cases applies to the work of each member of the board as well as to the board as a whole. For the psychologist, or the social worker, or the educator to attempt to carry out a detailed study and course of treatment for each and every case cannot do otherwise than swamp him with routine and useless detail. The institutional social worker and the psychologist have most often been the victims of this difficulty. The result is a mass of records about which everybody does nothing. The remedy seems to be threefold: First, routine procedures to be followed in every case should be cut to a bare minimum, consuming not more than one-fifth to one-fourth of the time of the paid personnel. Second, cases needing special attention should be identified early in the

institutional history of the men and then given all the attention and study that seems desirable or profitable. Third, the idea that administrative officers or professional practitioners have a research function must be abandoned. Research and administration require different mind-sets. In the interests of efficiency and economy of effort they should not be mixed in the functions of a single officer.

Research is one of the greatest needs in penology at the present time, but why have everybody tinkering with it? Specially qualified research workers should be designated for the work in a few selected institutions. Let the rest of us cooperate with them in every way, but otherwise keep hands off.

The prison educator is in special need of the results of research belonging properly in the field of psychiatry. From centuries of experience, he has learned the techniques of imparting information and skills. He knows how to handle groups. He is skilled in the arts of dealing with others in the teacher-student relationship. However, he is usually devoid of any scientific knowledge of the means for developing the emotional spheres of his students. Here is to be found the very foundation of most problems of personal maladjustment. Here is the greatest need of the prison educator. He wants to know how to bring about changes of attitude through training; how to increase self-respect; how to develop the social viewpoint; and again, how to cure functional stuttering by training; how to train a man away from undesirable nervous tics; and how to increase emotional drives. He is willing to assume the duties of the daily task under the direction of the psychiatrist if the psychiatrist will but tell him how.

COURT DECISION ON PUBLIC HEALTH

Borough held to be without power to require certificate of inspection for grave.—(Pennsylvania Superior Court; *Commonwealth* v. *Dickey*, 175 A. 285; decided Nov. 19, 1934.) An ordinance of the borough of Collingdale regulating the depth of graves provided that the board of health or such persons as it nominated should be vested with the authority to inspect graves and to issue certificates of inspection upon payment of $2. For failure to obtain such certificate a fine was provided, with imprisonment in default of payment of the fine. Acting under statutory authority the State department of health had promulgated regulations to be observed by undertakers, sextons, and other persons in charge of the interment or disposition of dead bodies. These regulations contained requirements governing the depth of graves but nothing concerning a certificate of inspection. The defendant, a cemetery superintendent, was convicted of failing to obtain a certificate of inspection for a grave as required by the

above-mentioned borough ordinance. On appeal the superior court said that the sole question before it was whether the ordinance was invalid and, in holding that it was, stated in part as follows:

Although the general borough act authorized boroughs to regulate the depth of graves, it also provided that nothing contained in the act shall be construed so as to repeal the provisions of any law, the enforcement of which is vested in the department of health. The department of health having promulgated a rule or regulation covering the subject-matter of the ordinance relating to the depth of graves, the borough was powerless to require certificates of inspection relating to the matters already provided for by the department of health. Within its sphere, the department of health has control of the health of the State, and the borough authorities are without power to impose restrictions and limitations on such subjects as the department of health has already covered by its own rules and regulations. Under the guise of a certificate of inspection, the borough authorities are not authorized to impose regulations and demand fees, in reference to powers that have been delegated to and have been exercised by the general health body of the State. The certificate was an additional requirement not authorized by the department of health and consequently an invasion of its authority, and therefore the ordinance is invalid. * * *

DEATHS DURING WEEK ENDED DEC. 15, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Dec. 15, 1934	Corresponding week, 1933
Data from 86 large cities of the United States:		
Total deaths	8,422	8,545
Deaths per 1,000 population, annual basis	11.7	11.9
Deaths under 1 year of age	581	596
Deaths under 1 year of age per 1,000 estimated live births	54	[1] 51
Deaths per 1,000 population, annual basis, first 50 weeks of year	11.3	10.9
Data from industrial insurance companies:		
Policies in force	67,072,330	67,329,101
Number of death claims	12,544	14,271
Death claims per 1,000 policies in force, annual rate	9.8	11.1
Death claims per 1,000 policies, first 50 weeks of year, annual rate	9.8	9.8

[1] Data for 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Dec. 22, 1934, and Dec. 23, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 22, 1934, and Dec. 23, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 22, 1934	Week ended Dec. 23, 1933	Week ended Dec. 22, 1934	Week ended Dec. 23, 1933	Week ended Dec. 22, 1934	Week ended Dec. 23, 1933	Week ended Dec. 22, 1934	Week ended Dec. 23, 1933
New England States:								
Maine		2	1	9	21	2	1	0
New Hampshire	1			2	36	174	0	0
Vermont	1				1	55	0	0
Massachusetts	11	16			151	511	3	2
Rhode Island	6	3			3		0	0
Connecticut	2	2	8	5	316	5	0	3
Middle Atlantic States:								
New York	57	51	[1] 65	[1] 9	631	467	5	2
New Jersey	16	19	322	29	36	32	0	0
Pennsylvania	72	67			888	171	3	1
East North Central States:								
Ohio	69	38	3	16	238	80	1	1
Indiana	39	34	50	49	148	39	0	1
Illinois	68	49	57	10	1,212	43	7	3
Michigan	8	17	6	3	111	20	1	2
Wisconsin	3	12	17	32	452	155	3	0
West North Central States:								
Minnesota	1	5			728	20	1	1
Iowa [2]	6	9	7	4	541	10	2	2
Missouri	27	41	92	7	71	108	1	1
North Dakota	4	2	6		94	19	0	0
South Dakota	4	2			40	310	0	0
Nebraska	5	5			59	5	1	0
Kansas	12	34			350	25	2	0
South Atlantic States:								
Delaware			2	1	3	2	0	0
Maryland [2]	15	18	15	27	41	33	0	0
District of Columbia	10	15	9	4	1	15	0	2
Virginia	30	42			173	73	0	0
West Virginia	48	38	18	63	213	20	0	3
North Carolina [3] [4]	36	71	49	19	407	649	1	2
South Carolina [4]	6	19	758	433	9	97	0	0
Georgia [4] [5]	14	25				524	0	0
Florida [3] [4]	10	15	1		3		0	0

See footnotes at end of table

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 22, 1934, and Dec. 23, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 22, 1934	Week ended Dec. 23, 1933	Week ended Dec. 22, 1934	Week ended Dec. 23, 1933	Week ended Dec. 22, 1934	Week ended Dec. 23, 1933	Week ended Dec. 22, 1934	Week ended Dec. 23, 1933
East South Central States:								
Kentucky	30	49	31	4	116	14	3	0
Tennessee	37	41	61	21	12	173	1	2
Alabama [4]	[illegible]	[illegible]	261	27	70	45	1	0
Mississippi [2]	8	18					0	0
West South Central States:								
Arkansas	13	17	50	8	5	123	0	0
Louisiana	34	23	6	4	17	3	2	0
Oklahoma [6]	15	23	160	20	1	13	0	4
Texas [4]	83	163	239	145	39	110	2	0
Mountain States:								
Montana	17	1		15	78		1	0
Idaho	1		6		5	4	0	0
Wyoming	1				4	20	0	0
Colorado	2	6		27	342	4	1	0
New Mexico	8	10	10	1	23	51	0	3
Arizona	2	5	20	12	63	5	1	0
Utah [2]			3		24	260	0	0
Pacific States:								
Washington		3			79	219	2	0
Oregon	2		51	13	23	14	0	0
California	22	30	20	34	46	209	1	0
	871	1,074	2,428	1,105	7,907	4,973	47	35

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 22, 1934	Week ended Dec. 23, 1933	Week ended Dec. 22, 1934	Week ended Dec. 23, 1933	Week ended Dec. 22, 1934	Week ended Dec. 23, 1933	Week ended Dec. 22, 1934	Week ended Dec. 23, 1933
New England States:								
Maine	0	1	30	6	0	0	2	0
New Hampshire	0	0	29	22	0	0	0	0
Vermont	0	0	14	5	0	0	1	0
Massachusetts	0	1	148	200	0	0	3	2
Rhode Island	0	0	8	4	0	0	1	2
Connecticut	0	0	39	50	0	0	0	0
Middle Atlantic States:								
New York	2	2	433	456	0	0	7	11
New Jersey	0	0	123	121	0	0	1	3
Pennsylvania	2	2	469	452	0	0	8	20
East North Central States:								
Ohio	0	4	477	383	1	0	5	5
Indiana	4	0	181	142	1	3	3	2
Illinois	2	4	658	387	1	1	29	4
Michigan	2	0	288	345	0	1	7	4
Wisconsin	1	2	360	116	8	29	0	2
West North Central States:								
Minnesota	1	0	185	49	5	1	2	2
Iowa [2]	0	0	44	81	0	0	4	0
Missouri	0	0	68	71	3	7	3	4
North Dakota	0	0	27	20	5	0	0	0
South Dakota	0	0	23	4	4	0	1	0
Nebraska	0	1	40	18	15	1	0	0
Kansas	1	2	90	132	1	4	1	8
South Atlantic States:								
Delaware	0	1	4	6	0	0	0	1
Maryland [2]	0	0	103	70	0	0	1	4
District of Columbia	0	1	29	17	0	0	0	3
Virginia	1	0	97	79	8	0	5	3
West Virginia	1	2	126	115	0	3	10	10
North Carolina [3, 4]	1	0	75	111	0	0	5	3
South Carolina [4]	0	1	5	11	0	1	1	1
Georgia [4, 5]	0	0	11	20	0	0	5	10
Florida [3, 4]	0	0	7	7	0	0	9	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 22, 1934, and Dec. 23, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 22, 1934	Week ended Dec. 23, 1933	Week ended Dec. 22, 1934	Week ended Dec. 23, 1933	Week ended Dec. 22, 1934	Week ended Dec. 23, 1933	Week ended Dec. 22, 1934	Week ended Dec. 23, 1933
East South Central States:								
Kentucky	0	0	43	92	0	0	2	5
Tennessee	0	0	52	76	1	1	5	2
Alabama [4]	0	0	12	24	5	1	3	5
Mississippi [2]	0	0	14	17	0	0	4	0
West South Central States:								
Arkansas	0	0	7	17	7	2	8	2
Louisiana	1	2	25	26	1	3	17	6
Oklahoma [6]	0	0	25	20	1	0	7	2
Texas [4]	0	0	69	123	3	2	44	24
Mountain States:								
Montana	1	0	33	7	0	1	2	4
Idaho	0	2	4	5	1	2	0	0
Wyoming	0	0	19	5	4	0	1	0
Colorado	0	0	151	26	2	6	2	9
New Mexico	0	1	24	38	1	0	13	4
Arizona	0	3	25	15	0	0	2	1
Utah [2]	0	0	55	14	0	3	3	0
Pacific States:								
Washington	6	0	54	32	41	3	3	3
Oregon	1	0	46	32	3	13	2	4
California	6	1	135	157	0	4	4	33
Total	33	33	5,014	4,226	122	92	236	205

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Rocky Mountain spotted fever, week ended Dec. 22, 1934, 3 cases, as follows: North Carolina, 1; Florida, 2.
[4] Typhus fever, week ended Dec 22, 1934, 25 cases, as follows: North Carolina, 2; South Carolina, 1; Georgia, 2; Florida, 1; Alabama, 7; Texas, 12.
[5] Dengue, week ended Dec. 22, 1934, Georgia, 28 cases.
[6] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
November 1934										
Illinois	14	354	85	10	1,343	1	11	2,248	2	99
Indiana	1	275	134		414		5	733	12	31
Michigan	3	71	24	8	221		16	1,005	0	39
Minnesota	1	32	4		693		14	448	39	6
Pennsylvania	8	231		2	1,979	1	12	1,670	0	90
Rhode Island	1	7			4		0	64	0	1
South Carolina	1	257	1,127	724	22	65	5	41	0	16
Texas	3	292	509	1,840	81	39	20	204	8	173
West Virginia	5	277	155		720		4	760	1	71

November 1934

	Cases
Actinomycosis:	
Illinois	1
Chicken pox:	
Illinois	1,70[illegible]
Indiana	465
Michigan	1,7[illegible]2
Minnesota	913
Pennsylvania	3,277
Rhode Island	111
South Carolina	12
Texas	52
West Virginia	208
Dengue:	
South Carolina	14
Texas	66
Diarrhea:	
South Carolina	198
Dysentery:	
Illinois (amoebic)	23
Illinois (amoebic carriers)	85
Illinois (bacillary)	16
Michigan	30
Minnesota (amoebic)	8
Minnesota (bacillary)	2
Pennsylvania	6
Texas	251
German measles:	
Illinois	137
Michigan	30
Pennsylvania	50
Hookworm disease:	
South Carolina	38
Jaundice, epidemic:	
Minnesota	4
Lead poisoning:	
Illinois	6
Pennsylvania	1
Lethargic encephalitis:	
Illinois	13
Indiana	5
Minnesota	1

November 1934—Continued

	Cases
Lethargic encephalitis—Continued	
Pennsylvania	5
South Carolina	1
Texas	3
Mumps:	
Illinois	21[illegible]
Indiana	14
Michigan	2[illegible]3
Pennsylvania	1,229
Rhode Island	17
South Carolina	6[illegible]
Texas	37
West Virginia	17
Ophthalmia neonatorum:	
Illinois	9
Pennsylvania	10
South Carolina	11
Paratyphoid fever:	
Illinois	2
Michigan	1
South Carolina	1
Texas	4
Puerperal septicemia:	
Illinois	4
Rabies in animals:	
Illinois	28
Indiana	40
South Carolina	52
Rabies in man:	
Pennsylvania	1
West Virginia	2
Rocky Mountain spotted fever:	
Illinois	1
Septic sore throat:	
Illinois	13
Michigan	53
Minnesota	1
Rhode Island	1
West Virginia	1

November 1934—Continued

	Cases
Tetanus:	
Illinois	7
Michigan	1
Trachoma:	
Illinois	3
Michigan	1
Minnesota	1
Pennsylvania	2
Trichinosis:	
Illinois	1
Michigan	1
Tularaemia:	
Illinois	16
Michigan	3
Minnesota	5
West Virginia	2
Typhus fever:	
South Carolina	6
Texas	16
Undulant fever:	
Illinois	9
Indiana	4
Michigan	7
Minnesota	9
Pennsylvania	3
South Carolina	1
Texas	1
Vincent's infection:	
Illinois	36
Michigan	26
Whooping cough:	
Illinois	857
Indiana	264
Michigan	697
Minnesota	229
Pennsylvania	1,751
Rhode Island	32
South Carolina	101
Texas	247
West Virginia	276

CASES OF VENEREAL DISEASES REPORTED FOR OCTOBER 1934

This statement is published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State health officers. They are preliminary and are, therefore, subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama [1]				
Arizona	35	0.77	187	4.13
Arkansas [2]	411	2.20	348	1.86
California	1,444	2.38	1,488	2.45
Colorado [1]				
Connecticut	217	1.32	183	1.11
Delaware	244	10.12	36	1.49
District of Columbia	160	3.23	111	2.24
Florida	491	3.16	72	.46
Georgia	728	2.50	440	1.51
Idaho	0		0	
Illinois	1,500	1.92	1,354	1.73
Indiana	177	.54	80	.24
Iowa [2]	115	.46	173	.70
Kansas	162	.85	93	.49
Kentu[illegible]	292	1.10	334	1.26
Louis[illegible]	194	.90	82	.38
Maine	41	.51	37	.46
Maryl[illegible]	620	3.73	259	1.56
Massach[illegible]	404	.94	626	1.45
Michigan	666	1.32	771	1.53
Minnesota	392	1.51	397	1.53
Mississippi	1,141	5.57	1,698	8.30
Missouri	300	.82	323	.88
Montana [2]	13	.24	39	.72
Nebraska	42	.30	88	.63

See footnotes at end of table.

CASES OF VENEREAL DISEASES REPORTED FOR OCTOBER 1934—Con.

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Nevada [1]				
New Hampshire	34	.72	16	.34
New Jersey	591	1.41	356	.85
New Mexico [3]				
New York	5,958	4.60	1,855	1.43
North Carolina	1,378	4.21	463	1.41
North Dakota	33	.48	68	.99
Ohio [2]	688	1.01	347	.51
Oklahoma [2]	126	.60	114	.55
Oregon	35	.36	61	.62
Pennsylvania	325	.33	280	.29
Rhode Island	84	1.20	60	.85
South Carolina [2]	242	1.38	343	1.96
South Dakota	13	.19	51	.73
Tennessee	988	3.71	589	2.21
Texas	538	.89	163	.27
Utah [1]				
Vermont	31	.86	46	1.27
Virginia	352	1.44	280	1.15
Washington	168	1.18	279	1.74
West Virginia [3]				
Wisconsin [4]	29	.10	228	.76
Wyoming [3]				
Total	21,422	1.81	14,818	1.25

[1] Not reporting.
[2] Incomplete.
[3] Have been reporting regularly but no report received for current month.
[4] Only cases of syphilis in the infectious stage are reported.

NOTE.—Surveys in which all medical sources have been contacted in representative communities throughout the United States have revealed that the monthly rate per 10,000 population is 6.6 for syphilis and 10.2 for gonorrhea.

WEEKLY REPORTS FROM CITIES

City reports for week ended Dec. 15, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0		0	0	3	5	0	0	0	1	19
New Hampshire:											
Concord	0		0	0	0	0	0	0	0	0	8
Nashua	0		0	0	0	2	0	0	0	0	
Vermont:											
Barre											
Burlington	1		0	2	0	5	0	0	1	0	5
Massachusetts:											
Boston	6		2	3	18	32	0	6	0	31	204
Fall River	0		0	29	1	0	0	2	0	2	25
Springfield	0		0	9	0	4	0	3	0	6	31
Worcester	0		0	4	4	15	0	2	0	[illegible]	44
Rhode Island:											
Pawtucket	0		0	0	1	0	0	0	0	[illegible]	17
Providence	3		0	2	5	7	0	2	0	[illegible]	51
Connecticut:											
Bridgeport	0		0	0	0	1	0	2	0	[illegible]	26
Hartford	0		1	98	4	4	0	1	0	[illegible]	28
New Haven	0	1	0	7	0	2	0	1	0	[illegible]	32
New York:											
Buffalo											
New York	28	61	23	31	140	132	0	90	8	242	1,524
Rochester	0		0	196	6	21	0	1	0	5	56
Syracuse	0		0	3	3	5	0	0	0	10	41

City reports for week ended Dec. 15, 1934—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
New Jersey:											
Camden	1	------	0	1	6	0	0	1	1	9	35
Newark	0	11	3	5	13	[illegible]	0	4	0	24	107
Trenton	0	1	0	2	2	[illegible]	0	3	0	4	34
Pennsylvania:											
Philadelphia	11	16	4	6	[illegible]	[illegible]	0	[illegible]	[illegible]	149	481
Pittsburgh	6	2	1	[illegible]	[illegible]	[illegible]	0	[illegible]	2	[illegible]	156
Reading	1	------	0	[illegible]	2	[illegible]	0	[illegible]	0	5	23
Scranton	0	------	------	[illegible]	------	[illegible]	0	------	0	5	------
Ohio:											
Cincinnati	15	------	0	2	12	[illegible]	0	[illegible]	0	0	156
Cleveland	11	53	0	12	15	[illegible]	0	[illegible]	1	[illegible]	170
Columbus	3	------	0	[illegible]	4	[illegible]	[illegible]	0	0	7	86
Toledo	1	------	0	21	3	[illegible]	[illegible]	5	0	9	72
Indiana:											
Fort Wayne	------	------	------	------	------	------	------	------	------	------	------
Indianapolis	10	------	0	1	12	[illegible]	0	[illegible]	0	[illegible]	------
South Bend	0	------	0	[illegible]	2	3	0	0	0	0	16
Terre Haute	0	------	0	1	1	0	0	0	0	0	16
Illinois:											
Chicago	10	5	5	69	63	277	0	31	1	38	726
Springfield	1	------	0	1	4	5	0	1	0	1	20
Michigan:											
Detroit	6	6	1	[illegible]	12	75	0	12	2	45	238
Flint	2	------	0	2	1	17	0	0	1	3	19
Grand Rapids	0	------	1	0	1	15	0	0	0	4	27
Wisconsin:											
Kenosha	0	------	0	2	1	7	0	0	0	14	8
Milwaukee	0	------	0	43	6	245	0	2	0	56	123
Racine	0	------	0	2	0	10	0	2	0	4	13
Superior	0	------	0	1	4	1	0	0	0	0	14
Minnesota:											
Duluth	9	------	0	217	2	0	0	3	0	0	33
Minneapolis	4	------	0	539	12	26	0	1	0	5	110
St. Paul	0	------	0	13	10	[illegible]	0	1	0	17	70
Iowa:											
Davenport	0	------	------	12	------	2	0	------	0	0	------
Des Moines	0	------	------	0	------	7	0	------	0	0	35
Sioux City	1	------	------	5	------	0	0	------	0	5	------
Waterloo	2	------	------	253	------	3	0	------	0	0	------
Missouri:											
Kansas City	3	------	1	0	15	9	0	4	1	0	92
St. Joseph	3	------	0	2	4	1	0	1	0	0	22
St. Louis	22	2	2	2	9	15	0	6	2	7	182
North Dakota:											
Fargo	0	------	0	0	3	2	0	0	0	7	9
Grand Forks	0	------	------	0	------	8	0	------	0	0	------
South Dakota:											
Aberdeen	0	------	------	7	------	0	1	------	0	5	------
Nebraska:											
Omaha	4	------	0	10	7	13	5	1	0	0	48
Kansas:											
Topeka	0	------	0	0	3	1	0	0	0	3	24
Wichita	0	------	0	0	2	0	0	1	0	0	33
Delaware:											
Wilmington	1	------	0	0	3	10	0	2	0	4	47
Maryland:											
Baltimore	5	7	1	1	10	40	0	17	0	34	210
Cumberland	0	------	0	4	0	3	0	0	0	0	10
Frederick	0	------	0	0	0	0	0	0	0	2	1
District of Columbia:											
Washington	9	1	0	5	8	17	0	11	0	6	162
Virginia:											
Lynchburg	1	------	0	5	1	3	0	0	0	1	10
Norfolk	------	1	0	0	5	4	0	1	1	5	41
Richmond	2	------	2	4	2	3	0	3	0	0	44
Roanoke	0	------	0	0	1	9	0	1	0	0	17
West Virginia:											
Charleston	2	1	0	17	1	2	0	0	0	1	21
Huntington	2	------	------	0	------	9	0	------	0	0	------
Wheeling	0	------	0	13	1	8	0	2	0	14	17
North Carolina:											
Raleigh	2	------	0	2	3	2	0	3	0	3	19
Wilmington	1	------	0	0	0	0	0	1	0	0	9
Winston-Salem	1	------	0	0	3	1	0	3	0	24	21

City reports for week ended Dec. 15, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
South Carolina:											
Charleston	0	19	0	0	1	0	0	2	0	0	30
Columbia	0	------	0	0	1	0	0	0	0	0	16
Greenville	0	------	0	0	2	0	0	0	0	2	12
Georgia:											
Atlanta	6	25	1	0	10	7	0	6	0	3	87
Brunswick	0	------	0	2	0	2	0	0	0	0	4
Savannah	2	3	0	0	8	1	0	2	0	0	41
Florida:											
Miami	3	------	0	1	6	0	0	2	1	0	------
Tampa	0	------	0	0	2	2	0	0	0	1	22
Kentucky:											
Ashland	------	------	------	------	------	------	------	------	------	------	------
Lexington	2	------	0	0	1	1	0	2	0	0	------
Louisville	7	3	2	3	5	17	0	5	0	0	89
Tennessee:											
Memphis	------	------	------	------	------	------	------	------	------	------	------
Nashville	1	------	0	1	5	6	0	1	0	6	56
Alabama:											
Birmingham	4	3	0	0	10	6	0	5	4	2	70
Mobile	2	2	0	0	0	0	0	4	0	0	24
Montgomery	2	------	------	0	------	2	0	------	0	0	------
Arkansas:											
Fort Smith	------	------	------	------	------	------	------	------	------	------	------
Little Rock	0	------	0	1	3	1	0	3	0	0	------
Louisiana:											
New Orleans	22	7	2	1	23	6	0	21	0	0	198
Shreveport	1	------	0	3	3	3	0	5	3	0	37
Oklahoma:											
Oklahoma City	0	2	0	2	8	3	0	1	1	0	44
Texas:											
Dallas	10	------	0	0	8	3	0	2	1	1	63
Fort Worth	3	------	0	0	5	5	0	5	1	1	46
Galveston	2	------	1	0	1	1	0	0	0	0	15
Houston	8	------	0	1	10	1	1	4	0	0	73
San Antonio	2	------	2	2	3	1	0	9	1	0	74
Montana:											
Billings	2	------	0	15	0	0	0	0	0	0	4
Great Falls	0	------	0	0	3	0	0	0	0	0	18
Helena	0	------	0	18	0	0	0	0	0	0	4
Missoula	0	------	------	0	------	0	0	------	0	0	1
Idaho:											
Boise	------	------	------	------	------	------	------	------	------	------	------
Colorado:											
Denver	2	47	1	208	6	133	0	7	0	4	81
Pueblo	0	------	1	0	2	5	0	1	0	0	12
Utah:											
Salt Lake City	1	------	1	6	9	33	0	1	1	22	45
Nevada:											
Reno	0	------	0	0	1	0	0	0	0	0	4
Washington:											
Seattle	0	------	0	0	4	1	4	5	0	2	105
Spokane	0	------	0	13	3	7	0	0	0	0	36
Tacoma	0	------	0	2	3	1	9	0	0	0	37
Oregon:											
Portland	0	1	0	3	5	12	0	2	0	0	91
Salem	0	2	------	0	------	0	0	------	0	1	------
California:											
Los Angeles	22	29	0	5	13	69	15	15	[illegible]	5	324
Sacramento	6	------	0	0	4	4	0	1	[illegible]	0	32
San Francisco	2	4	2	12	13	14	0	10	0	15	168

City reports for week ended Dec. 15, 1934—Continued

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Minnesota:			
Boston	0	1	0	St Paul	1	0	0
Springfield	1	1	0	Nebraska:			
Worcester	1	1	0	Omaha	0	1	0
Rhode Island:				Georgia:			
Providence	1	0	0	Atlanta	1	0	0
New York:				Alabama:			
New York	2	4	1	Mobile	1	0	0
Ohio:				Oklahoma:			
Cincinnati	1	2	0	Oklahoma City	1	1	0
Cleveland	0	1	0	Washington:			
Illinois:				Seattle	0	0	1
Chicago	1	0	0	California:			
Michigan:				Los Angeles	0	0	1
Detroit	1	0	1	Sacramento	0	0	2
Wisconsin:							
Milwaukee	0	0	1				

Dengue.—Cases: Atlanta, 3; Savannah, 25; Miami, 1.
Lethargic encephalitis.—Cases: Springfield, Mass., 1; New York, 1.
Pellagra.—Cases: Baltimore, 2; Charleston, S. C., 1; Tampa, 1; Birmingham, 1; New Orleans, 1.
Typhus fever.—Cases: Boston, 1; New York, 1; Baltimore, 1; Charleston, S. C., 1; Savannah, 1; Montgomery, 2.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended December 1, 1934.—During the 2 weeks ended December 1, 1934, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis								1		1
Chicken pox		96	12	462	916	145	235	58	156	2,080
Diphtheria		5	8	62	26	48	3	1	4	157
Dysentery				3						3
Erysipelas		1		11	4	4	1	4	1	26
Influenza		12	1	3	16	1			12	45
Lethargic encephalitis				1						1
Measles		388	1	1,055	110	222	197	4	21	1,998
Mumps					242	19	8	1	84	354
Paratyphoid fever					1					1
Pneumonia					4		2		6	12
Poliomyelitis				1	2			1	1	5
Scarlet fever	6	30	62	284	334	96	14	10	83	919
Smallpox								1		1
Trachoma									1	1
Tuberculosis		3	12	110	81	4	15	5	37	267
Typhoid fever		1		55	18	5	2	4		85
Undulant fever				1	3		9			13
Whooping cough	1	28	4	371	259	28	25	8	32	756

CEYLON

Malaria.—According to a report dated December 17, 1934, an epidemic of malaria is spreading in Ceylon, with about 500,000 cases reported. Not many deaths have occurred.

ITALY

Communicable diseases—4 weeks ended May 27, 1934.—Dur[illegible] the 4 weeks ended May 27, 1934, certain communicable diseases were reported in Italy, as follows:

Disease	Apr. 30–May 6		May 7–13		May 14–20		May 21–27	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	17	15	11	11	18	15	10	10
Cerebrospinal meningitis	15	13	13	12	18	16	13	9
Chicken pox	408	126	299	119	309	139	331	[illegible]
Diphtheria and croup	371	208	338	105	374	205	332	177
Dysentery	11	5	7	3	9	5	20	15
Lethargic encephalitis	1	1			4	4	3	[illegible]
Measles	2,081	402	2,535	405	2,773	411	2,588	421
Poliomyelitis	10	10	14	11	16	12	21	17
Scarlet fever	221	95	183	84	260	108	187	84
Typhoid fever	202	145	217	132	232	135	[illegible]	192

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information [illegible] world [illegible] appeared in the PUBLIC HEALTH REPORTS for Dec[illegible] [illegible] the PUBLIC HEALTH REPORTS to be issued Jan[illegible] [illegible] time being in the issue published on the last Friday of each month.)

Plague

Brazil—Alagoas State.—According to a report dated December 12, 1934, 5 cases of bubonic plague with 2 deaths were reported in Alagoas State, Brazil.

Typhus Fever

Egypt—Aswan.—During the week ended November 24, 1934, two cases of typhus fever were reported in Aswan, Egypt.

Yellow Fever

Ivory Coast—Toumodi.—On December 10, 1934, four suspected cases of yellow fever were reported in Toumodi, Ivory Coast.

UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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# PUBLIC HEALTH REPORTS

VOL. 50 JANUARY 11, 1935 NO. 2

A NOTE ON THE INCIDENCE OF AMOEBIC DYSENTERY IN NEW YORK CITY*

By ROBERT OLESEN, *Medical Director, United States Public Health Service*, and JACOB ROSENBLUTH, *Chief Diagnostician, Bureau of Preventable Diseases, Department of Health, New York City*

Prior to October 1933 neither amoebic nor bacillary dysentery was reported with any degree of frequency in New York City. In fact, the reports of these two diseases were combined in the official records of the Department of Health, as shown in table 1. Thus 19, 20, and 20 cases were reported during the years 1930, 1931, and 1932, respectively, relatively small numbers for a large city. However, these few reports do not necessarily represent the real incidence of the diseases as they may actually have occurred, for many cases are not made known to the health authorities, through inadvertance, neglect, or failure to recognize the conditions involved. But even though not strictly accurate, this scarcity of reports indicates that the dysenteries were not being encountered or not being recognized to any considerable extent.

In October 1933, reports of cases of dysentery in New York City began to increase in number. However, investigation of the 11 cases of dysentery reported during that month disclosed that 10 were bacillary and only 1 was amoebic in type. Therefore, there was no indication at that time of the unusual incidence of amoebic dysentery that was impending. Early in November 1933 a warning was received from the health authorities in Chicago that a sharp epidemic of amoebic dysentery was occurring in that city. Furthermore, many of the persons who had acquired the infection in Chicago were visitors from various parts of the country. It was regarded as inevitable that these individuals would have the disease upon returning to their homes and, consequently, would constitute a definite local public health problem. At this time it became known that an outbreak of amoebic dysentery had occurred in Chicago during August 1933 among the employees and guests of several hotels and eating establishments.[1] At first regarded as an infection due to

* Published with the permission of the Commissioner of Health, New York City, who assumes no responsibility for the views expressed.

[1] Bundesen, Herman N., Rawlings, Isaac D., and Fishbein, William I.: The health hazard of amoebic dysentery. Jour. Am. Med. Assoc., 101: 21, 1639, Nov. 18, 1933.

human carriers, it was afterward disclosed, as a result of epidemiological investigations, that the infection had undoubtedly been conveyed through the medium of water in faulty plumbing.

The influx of amoebic dysentery cases into New York City caused the immediate inauguration and continuation of intensive epidemiological studies of all cases of the disease reported to the Department of Health. A review of the data that have been gathered is particularly interesting as illustrating the rapid spread of the amoebic infection from its original focus in Chicago. Incidentally it was noted that some cases of the disease, not traceable to focal contact in Chicago, were coincidentally reported in New York City, the number of these cases being somewhat larger than the figures shown in table 1.

From November 1, 1933, to September 30, 1934, 121 cases of amoebic dysentery were reported to the Department of Health in New York City. The age groups, sex, and sources of infection of the individuals included in this group are shown in table 2. The various findings and their implications will be discussed briefly.

Sex incidence.—As shown in table 2, 71 males and 50 females in the group under consideration had amoebic dysentery. Of the entire group, 45 males and 28 females, a total of 73, or 60.3 percent, acquired the infection in Chicago. That many more males than females were recorded as suffering from the disease may be accounted for to some extent by the fact that many men who visited Chicago at that time were not accompanied by members of their families. However, there were several instances in which both husband and wife had the disease.

Age incidence.—It is interesting to note that, among the total number of cases recorded, only 1 of the patients was under 9 years of age and only 5 were between 10 and 19 years of age. Here again it may be surmised that younger members of families may not have accompanied their elders to Chicago, although no dearth of children and young people was noticeable at the Century of Progress Exposition, the occasion for most of the visits.

Extra-Chicago sources of amoebic infection.—Table 2 also shows that 48, or 39.7 percent, of the 121 cases of amoebic dysentery could not be charged to infection acquired in Chicago. Thus, 13 cases apparently originated in New York City, 15 in places in the United States other than Chicago and New York City, and 12 in foreign countries. In 8 instances the source of infection could not be ascertained. All cases which failed to give a definite history of having been out of town within a reasonable period of time prior to the onset of the illness were classified as of New York City origin. In no instance was there any direct contact or close association between any two cases of this group. This supports McCoy's contention that, "There appears to be very little evidence that clinical cases originating in Chicago have

led to any considerable spread of the infection in the communities to which the infected individuals have gone."[2]

TABLE 1.—*Number of cases of dysentery (all forms) reported in New York City, by months, from 1929 to 1933, inclusive*

Month	Year				
	1929	1930	1931	1932	1933
January		1	2		2
February		2	3		1
March		7	2		1
April		1	4		1
May			2		5
June				4	1
July				1	5
August		2		3	2
September		1	4	6	5
October	2	2	3	5	11
November		1		1	26
December		2			29
Total	2	19	20	20	89

TABLE 2.—*Age groups, sex, and sources of infection of 121 persons reported as having amoebic dysentery in New York City, from Nov. 1, 1933, to Sept. 30, 1934*

Age group (years)	Source of infection										Total
	Male					Female					
	Chicago	New York City	Other places in United States	Foreign countries	Unknown	Chicago	New York City	Other places in United States	Foreign countries	Unknown	
0-9		1									1
10-19	1		1		1			1		1	5
20-29	2	4	3	3		3	1	4	2		22
30-39	10	2	1		2	9	1	3	3		31
40-49	17		1	3		10		1		1	33
50-59	9				1	5	2			2	19
60 and over	6	2		1		1					10
Total	45	9	6	7	4	28	4	9	5	4	121

Sources of infection in Chicago.—According to the Chicago Board of Health, two hotels in that city were believed to have been the principal sources of amoebic dysentery infection. The epidemiological studies conducted in New York City disclosed that of the 73 persons affected with the disease 58 had eaten in hotel A, 6 in hotel B, and 4 in both hotels A and B. Of the remainder, 4 persons gave no history of having eaten in either of these hotels while in Chicago, while in one instance no information could be obtained, the patient having died.

Outcome of illness.—On September 30, 1934, 17 deaths, a percentage of 14.0, had already been recorded among the 121 patients with

[2] McCoy, G. W.: Control of amoebic dysentery. Pub. Health Rep., 49: 11, 359, March 16, 1934.

amoebic dysentery. Among the remainder, 41 were said to have recovered from the malady while 63 were still under treatment. That additional deaths occurred among those under treatment is quite likely. These and additional facts are shown in table 3. It will be noted that deaths occurred among individuals whose infection was apparently acquired outside of Chicago.

TABLE 3.—*Outcome (recovery, continued treatment, or death, as of Sept. 30, 1934) among 121 persons with amoebic dysentery in New York City, according to the probable source of infection*

Probable source of infection	Recovered	Under treatment	Died	Total
Chicago	30	37	6	73
New York City	2	8	3	13
Other places in United States	6	7	2	15
Foreign countries	3	7	2	12
Unknown		4	4	8
Total	41	63	17	121

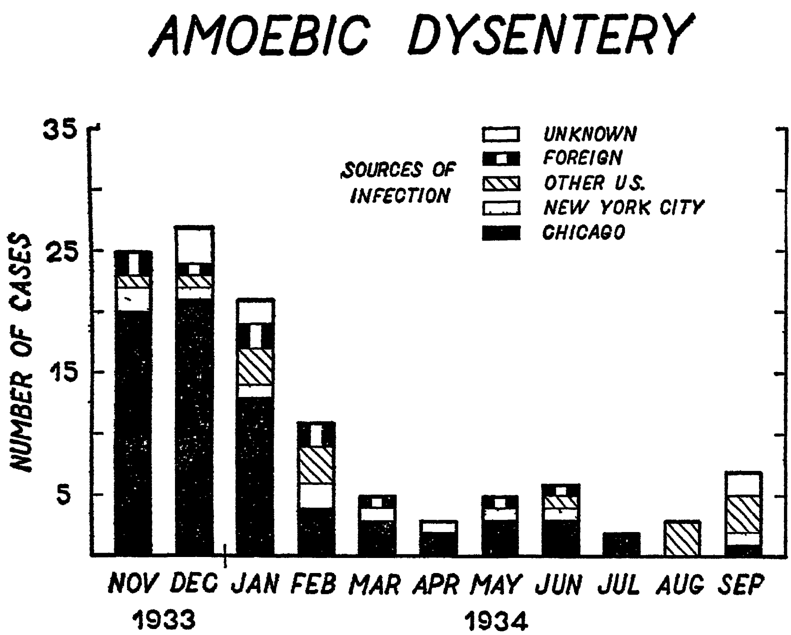

FIGURE 1.—Cases of amoebic dysentery in New York City by source of infection.

Monthly incidence of amoebic dysentery in New York City.—The rise and fall in amoebic dysentery incidence during the period under discussion is shown in table 4. Figures are available from January 1, 1933, to September 30, 1934. The largest number of cases, 27, was reported in December 1933. Thereafter the affection declined irregularly but decidedly. This information is displayed graphically in figure 1. The uniform incidence of cases originating in foreign

countries is plainly shown. It is believed that insofar as New York City is concerned much of the so-called normal incidence of amoebic dysentery may be ascribed to persons who bring the infection from foreign countries and from other parts of the United States. From January 1, 1934, to September 30, 1934, 32 cases of amoebic dysentery and 158 cases of bacillary dysentery, having other than Chicago as the source of infection, were reported in New York City. These figures afford a better indication of the incidence of dysentery in the city. The apparent increase in the number of cases may be due to greater interest in the disease on the part of physicians, better reporting, or increased diagnostic skill.

TABLE 4.—*Incidence of amoebic dysentery, by months, in New York City (Jan. 1, 1933, to Sept. 30, 1934), according to probable sources of infection*

Month	Source of infection					
	Chicago	New York City	Other places in United States	Foreign	Unknown	Total
1933						
January				1		1
April					1	1
June		1				1
August			1			1
September				1		1
October	1					1
November	20	2	1	2		25
December	21	1	1	1	3	27
1934						
January	13	1	3	2	2	21
February	4	2	3	2		11
March	3	1		1		5
April	2	1				3
May	3	1		1		5
June	3	1	1	1		6
July	2					2
August			3			3
September	1	1	3		2	7
Total	73	12	16	12	8	121

Onset of disease and date of report.—Reference has already been made to the observation of Bundesen et al. that an outbreak of amoebic dysentery occurred in Chicago in August 1933. The available information quite clearly shows that many of the amoebic dysentery patients encountered in New York City acquired the disease at the time specified. From table 5 it will be seen that the onset of a considerable number of cases, 57, was set as occurring during the months of July, August, September, and October 1933, while reports to the Department of Health were first made in November. These facts are of considerable importance as indicating the interval that elapsed between the onset of symptoms and the date the Department of Health first learned of the infection in New York City.

TABLE 5.—*Onset and report of cases of amoebic dysentery, by months, in New York City, from Jan. 1, 1933 to July 31, 1934*

Month and year of onset	Number of cases	Cases reported to the Department of Health	Month and year of onset	Number of cases	Cases reported to the Department of Health
Prior to January 1933	6		1934		
1933			January	6	21
January	1	1	February	4	11
February			March	1	5
March			April	2	3
April	1	1	May	2	5
May	4		June	2	6
June	1	1	July	4	2
July	9		August	3	3
August	9	1	September	1	7
September	16	1	Total	121	121
October	23	1			
November	21	25			
December	5	27			

The chronicity of amoebic dysentery is apparent from the histories of 6 cases in which the dates of onset were 14, 13, 11, 7, 6, and 3 years, respectively, prior to the reporting of the disease. These cases are displayed separately in figure 2.

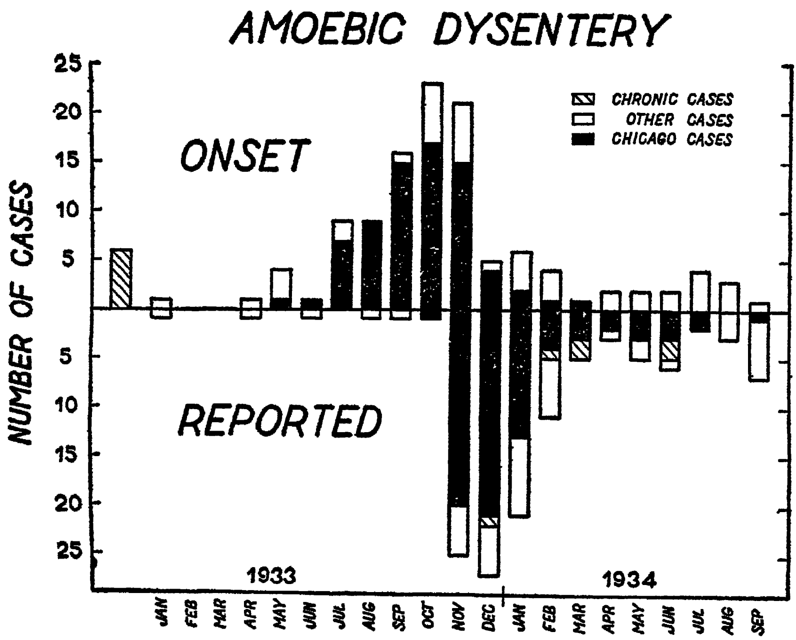

FIGURE 2.—Cases of amoebic dysentery in New York City by dates of onset and report.

CONCLUSIONS

1. Amoebic dysentery in sufficient degree to cause noticeable symptoms, is probably present in New York City at all times. A

considerable number of cases are probably not reported to the Department of Health.

2. Much of the amoebic dysentery reported in New York City appears to have originated outside of the city or in foreign countries. The amount of the foreign infection appears to be steady and constant, though not considerable.

3. The outbreak of amoebic dysentery in Chicago in August, September, and October 1933, was responsible for the appearance of the disease in at least 73 persons who visited Chicago and returned to New York City. It is believed that this number represents only a portion of those who acquired the infection at that time.

4. The mortality of 14.0 percent among the 121 patients included in the present report directs attention to the relative severity of the infection, and the need for prompt diagnosis and adequate treatment.

5. Because of efficient transportation facilities, the frequency with which people travel about the country, and the rapidity of disease transference from one section to another, all public health officials have a common problem in preventing and controlling such affections as amoebic dysentery.

6. It is essential that the existence of a disease to an unusual extent be made known promptly to public health officials generally, probably through a central clearing house. With such information it would be possible to institute prompt and appropriate action.

7. Inasmuch as the dysentery infection in Chicago is believed to have been conveyed through the medium of defective plumbing, it behooves all municipalities to take such steps as may be required to prevent the repetition of such an occurrence.

EFFECT OF EXPERIMENTAL LOCAL IRRITATION UPON SUSCEPTIBILITY TO VACCINE AND ENCEPHALITIS VIRUS (St. Louis type)*

By CHARLES ARMSTRONG, *Surgeon, United States Public Health Service*

Different agents have been reported as exerting a local modifying influence upon the character of vaccine "takes" in animals by Ledingham (1), Carnot and his coworkers (2), Le Fevre (3), Rivers and associates (4), Seiffert (5), Armstrong (6), and others.

The author (6) in a previous communication showed that the site of a positive Schick response in rabbits remained relatively insusceptible to vaccine virus for at least 20 days. Subsequent to that publication the local inhibitory effect of a previous irritation with diphtheria toxin was further investigated by instilling this agent into the left eyes of rabbits, the instillations being repeated

*From the National Institute of Health, Washington, D. C.

until a conjunctivitis was induced. The animals were then allowed to remain untreated from 3 to 4 weeks until the toxin-treated eyes had apparently returned to normal. An appropriate dilution in saline of heat-selected vaccine virus 28628 (7) was then instilled into each eye, the lower lid being pulled from the eye by gentle traction on the palpebral hair held between the thumb and finger of an attendant. The pocket thus formed behind the lid was then filled with 1:10 dilution of vaccine virus which was allowed to remain therein for 30 seconds.

Both eyes of each rabbit received similar treatment. No scarification of any kind was attempted, as it had been found that in this concentration the virus employed would usually "take" on the unscarified surface of the eye. The eyes were examined daily thereafter, and their condition was recorded. By reference to table 1 it may be noted that the toxin-treated eyes tended to be involved later, to be less severely affected, and to recover earlier and more completely than did the nontreated control eyes of the same animals. With the control eyes the lids were often left markedly thickened and puckered and the cornea opaque, while the toxin-prepared eyes tended to return more nearly to normal (figs. 1 and 2). The skin below the control eyes was usually relatively more "scalded" by the greater amount of exudate than was the skin of the toxin-prepared eyes. While the prepared eye became infected with vaccine virus in one instance where its untreated mate remained normal (rabbit 2335), the opposite was true in 3 instances (rabbits 2336, 2337, 2341). The treated eyes in 12 rabbits that survived to recovery evidenced acute vaccinal lesions for a total of 75 days, while the untreated eyes showed acute changes for a total of 128 days.

In view of these results with the conjunctivae it becomes a matter of interest to determine whether the mucous membrane of the nose, a natural route for infection, can be rendered less susceptible to infection through previous irritation. For determining this point white mice were treated by instilling various mild irritants into the nostrils at weekly intervals and then testing them for susceptibility, 4 days to 1 week after the last instillation, by inoculating them with the virus of encephalitis (St. Louis type) by the same route.

Sodium alum, hypertonic saline, and concentrated glucose solutions were used as preliminary irritants. By reference to table 2 it may be seen that the variously prepared groups of animals tended to resist intranasal inoculation better than did the controls. The group receiving preliminary inoculations of 3 percent alum showed 83 percent survivals following the intranasal virus inoculations, those receiving 4 percent saline showed 64 percent, and those treated with

FIGURE 1.—Effect of vaccine virus upon toxin prepared left eye (Rabbit 2208). Lid slightly thickened, not puckered. Cornea clear. (April 25, 1933.)

FIGURE 2.—Effect of vaccine virus upon control, not prepared, right eye (Rabbit 2208). Lid thickened and puckered. Cornea opaque. (April 2[illegible], 1933.)

10 percent to 20 percent glucose solution showed 48 percent survivals, as compared with 38 percent of survivals for the nonprepared control group. Deaths, when they occurred, also tended to be later in the prepared groups.

Since 3 percent sodium alum solution gave the best results of any agents tried, it was deemed desirable to test the effect of weaker solutions. From table 3 it may be noted that they were less effective. Stronger solutions tended to kill some of the animals within a few hours, probably due to the tissue changes mechanically interfering with respiration.

In considering the modifying action of diphtheria toxin upon the cutaneous response to vaccine virus in rabbits, it was shown (6) that the effect was due to the induced tissue response which modified the subsequent local and general reaction to vaccine virus rather than to any direct action of the toxin upon the infectious agent. It is believed that the same explanation applies to the effects above recorded with agents introduced into the nostrils, although it is conceivable that these effects may be due to a toughening of the mucous membranes by the astringent agents which rendered them mechanically impermeable to the virus. That this latter explanation is not the correct one is indicated by the fact (table 3), that 42 of 63 intranasally prepared white mice which survived the intranasal virus inoculation proved to be immune to an intracerebral inoculation of virus which killed all of 55 normal control mice, while among 52 unprepared animals which survived the intranasal inoculation there were 29 which survived the intracerebral immunity test.

It was found that the intranasal inoculation of alum did not influence the resistance of mice to an intracerebral inoculation of virus, thus indicating that the protective effect of the alum was a purely local one. Olitsky and Cox (8) recently reported that tannic acid, 0.5 to 1 percent solution, when instilled into the nostrils of white mice 3 times daily for 3 successive days, rendered the mice temporarily markedly resistant to the intranasal inoculation of equine encephalomyelitis virus administered 1 day following the last tannic acid treatment, but report no immunity tests on the survivors.

The experimental results above recorded suggest that through the occasional introduction of astringent or other agents into the nostrils, the local tissues may be so modified that resistance to recognizable infection by this route may be increased while the capacity to develop specific immunity through subclinical infection is not interfered with or may even be enhanced. It is possible, however, that such astringent or mildly irritant treatment, if applied in the face of an epidemic or in the presence of the virus, might enhance susceptibility to infection. In order to test this possibility, groups of mice were given 0.04 cc of 3 percent alum intranasally 1 day before and 1, 2, and 3

TABLE 1.—*Conjunctivitis induced by diphtheria toxin and its influence upon subsequent local infection with vaccine virus*

Rabbit no.	Treatment dates: Diphtheria toxin 1:1 (left eye)							Treatment dates: Vaccine virus 1:10 dil.	Condition of diphtheria toxin-prepared left eyes by days following application of vaccine virus: 3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Remarks
2205	Jan. 27, 1933	Jan. 30, 1933	Feb. 1, 1933	Feb. 3, 1933	Feb. 4, 1933	Feb. 8, 1933	Feb. 14, 1933	Mar. 10, 1933	—	—	1	1	1	2	D	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	No ulcers on cornea.
2206									—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—					
2207									—	1	2	3	3	3	3	3	3	3	D	...	...	...	...	...	...	...	...	...	...	...	Cornea opaque; no ulcers.
2208									—	—	3	3	3	3	3	3	3	3	3	2	2	1	...	...	...	...	...	...	...	...	Normal.
2209									—	—	1	2	2	2	2	2	2	2	2	2	1	1	...	...	...	...	...	...	...	...	Normal.
2210									—	1	1	3	3	3	3	3	3	3	2	2	2	2	2	1	1	...	...	...	...	...	Sl. opaque; lid sl. thick.
2211									—	—	—	—	—	—	—	D	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Pneumonia.
2212									—	—	1	2	3	3	3	3	3	3	3	2	1	1	—	...	...	...	...	...	...	...	Normal.
2335	Mar. 25, 1933	Mar. 27, 1933	Mar. 28, 1933	Apr. 4, 1933	Apr. 6, 1933	Apr. 10, 1933	Apr. 14, 1933	May 10, 1933	2	2	2	3	3	3	4	4	4	3	2	2	1	1	1	...	...	...	...	...	...	...	Cornea clear; lid thickened.
2336									—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	...	...	...	...	...	...	Normal.
2337									—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	...	...	...	...	...	...	Normal.
2338									—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	...	...	...	...	...	...	Normal.
2339									—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	...	...	...	...	...	...	Normal.
2340									—	—	—	—	—	—	—	—	—	—	1	4	4	3	2	1	1	1	...	...	...	...	Normal.
2341									—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	...	...	...	...	Normal.

Rabbit no.	Treatment dates: Diphtheria toxin 1:1 (left eye)	Treatment dates: Vaccine virus 1:10 dil.	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Remarks
			Condition of nonprepared right eyes (controls) by days following application of vaccine virus																						
2205		Mar. 10, 1933	—	1	3	3	3	4	D			—													Ulcers on cornea.
2206			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				
2207			—	1	2	3	3	3	3	3	3	3	D												Central ulcer—opaque.
2208			1	3	4	4	4	4	4	4	4	4	4	4	3	3	2	1	1	1					Cornea opaque, lid thick.
2209			—	—	1	2	3	3	3	3	3	3	3	4	4	4	3	3	2	1					Pupil irregular, lid thick.
2210			—	1	2	3	3	4	4	4	4	4	4	4	4	3	3	3	2	1					Cornea opaque, lid very thick.
2211			—	—	—	—	—	—	—	D															
2212			—	—	1	2	3	3	3	3	3	3	3	2	1	1	—								Normal.
2335		May 10, 1933	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—						Normal.
2336			—	—	1	2	2	2	3	3	3	2	1	1	—	—	—	—	—						Normal.
2337			1	2	2	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	2	Cornea cloudy, lid thick
2338			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—					Normal.
2339			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—					Normal.
2340			—	1	2	4	4	4	4	4	4	4	4	4	4	4	3	3	3	2	2	2	2	1	Cornea opaque, lid thick.
2341			—	1	3	4	4	4	3	3	3	3	3	2	2	1	1	1	—	—					Normal.

1=slight irritation.
2=slight irritation and swelling.
3=marked irritation, swelling, watery exudate.
4=swollen shut, pussy exudate.
D=died.

TABLE 2.—*Effect of the intranasal administration of various substances upon subsequent intranasal exposure to encephalitis virus (white mice)*

Preliminary intranasal treatment materials	Dates of intranasal treatment (1934)							Encephalitis virus, 1:800 dil intranasally	Deaths by days following intranasal inoculation with encephalitis virus																	Number of mice inoculated intranasally[1]	Number of mice surviving virus inoculation	Percent survived
	July 18	July 27	Aug. 3	Aug. 10	Aug. 18	Aug. 27	Sept. 3	Sept. 7	Sept. 8	Sept. 9	Sept. 10	Sept. 11	Sept. 12	Sept. 13	Sept. 14	Sept. 15	Sept. 16	Sept. 17	Sept. 18	Sept. 19	Sept. 20	Sept. 21	Sept. 22	Sept. 23	Sept. 24			
Sodium alum, 3 percent	+	+	+	+	+	+	+	+			3		1			1	1	1			1		1			35	29	83
Sodium chloride, 4 percent	+	+	+	+	+	+	+	+			1	1			3	2	4	1		1		1				31	20	64
Glucose, 10 to 20 percent	+	+	+	+	+	+	+	+			2		1	1	3		1	4	2				1			25	12	48
Nontreated controls	–	–	–	–	–	–	–	+						4	8	6	6				2					42	16	38

[1] Mice dying within 4 days of the intranasal inoculation are excluded.

TABLE 3.—*The effect of the intranasal administration of various dilutions of sodium alum upon subsequent intranasal exposure to encephalitis virus (white mice)*

Preliminary intranasal treatment	Date of intranasal treatment (1934)		Date of intranasal inoculation with encephalitis virus	Deaths by days following intranasa linoculation with encephalitis virus																	Number of mice inoculated intranasally	Number of mice surviving inoculation 4 days or more
	Oct. 16	Oct. 23	Oct. 30	Oct. 31	Nov. 1	Nov. 2	Nov. 3	Nov. 4	Nov. 5	Nov. 6	Nov. 7	Nov. 8	Nov. 9	Nov. 10	Nov. 11	Nov. 12	Nov. 13	Nov. 14	Nov. 15	Nov. 16		
Solution of sodium alum, 3 percent	+	+	+							3	2	2							1		29	21
Solution of sodium alum, 1.5 percent	+	+	+							2	5	3	2								29	17
Solution of sodium alum, 0.75 percent	+	+	+							3	12						1				29	13

Table 4.—*The effect of the intranasal administration of 3% sodium alum when given shortly before and shortly after the intranasal exposure to encephalitis virus (white mice)*

Preliminary intranasal treatment	Date of intranasal treatment (1931)					Death by days following intranasal inoculation with encephalitis virus																	Number of mice inoculated intranasally	Number of mice surviving virus inoculation
	Sept. 20	Sept. 21	Sept. 22	Sept. 23	Sept. 24	Sept. 25	Sept. 26	Sept. 27	Sept. 28	Sept. 29	Sept. 30	Oct. 1	Oct. 2	Oct. 3	Oct. 4	Oct. 5	Oct. 6	Oct. 7	Oct. 8	Oct. 9	Oct. 10	Oct. 11		
Solution of sodium alum, 3 percent	+	Virus	−	−	−	---	1	---	---	1	3	1	1	---	---	---	---	---	---	---	---	---	15	8
Do	−		+	−	−	---	---	1	1	4	6	1	---	---	---	---	1	---	---	---	---	---	19	5
Do	−		−	+	−	1	1	2	2	2	8	---	---	---	---	---	---	---	---	---	---	---	20	4
Do	−		−	−	+	---	---	1	4	3	3	---	---	---	1	1	---	---	---	---	---	---	19	6
Nontreated controls	−		−	−	−	---	---	3	4	5	4	2	---	---	---	---	---	---	---	---	---	---	20	2

days following the intranasal virus inoculations. The results (table 4) indicate that such application just preceding or soon after the intranasal administration of the virus does not increase susceptibility but may actually decrease it. The experimental work here reported therefore suggests lines of study which may possibly lead to the development of procedures of practical value in preventing infections contracted by way of the nasal mucous membranes.

SUMMARY

1. Previous irritation of the conjunctivae of rabbits by the instillation of diphtheria toxin tends to render the eye relatively resistant to infection with vaccine virus for at least 26 days after the last toxin application.

2. The action of 3 percent sodium alum when introduced at weekly intervals into the nostrils of white mice tends to render the animals relatively resistant to infection with encephalitis virus (St. Louis type) administered by the same route. Saline, 4 percent, and glucose, 10 percent to 20 percent, exert a similar though less marked effect.

3. The immunity response to intranasal inoculation with encephalitis virus is not prevented by the preliminary treatments of the avenue of infection.

4. Alum 3 percent when administered intranasally to white mice, just before or just after the application of encephalitis virus by the same route, did not enhance the susceptibility of the animals to the virus.

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BLOOD CHOLESTEROL IN LEPROSY

A Study of the Total and Free Cholesterol, Cholesterol Esters, Van den Bergh Reaction, and the Complement Fixation Test

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In recent years considerable attention has been given to the subject of cholesterol and its diagnostic importance. It has long been known

that cholesterol occurs in the animal body in two principal forms; namely, free and combined with the higher fatty acids as cholesterol oleate, palmitate, and stearate, termed "cholesterol esters." Cholesterol is possibly an almost universal constituent of the body tissues. It enters into the structural make-up of the cells. It is found abundantly in the nerve tissue, liver, bile, red blood cells, and plasma. It is a constituent of the normal skin secretions, both the sebum and perspiration.

The values of the cholesterol in the blood of human beings represent the resultant of many factors. It is agreed that the greatest source is exogenous, and that this alimentary absorption depends on the amount of cholesterol in the ingested food and the presence of fatty acids, bile, and pancreatic juices in the intestine. There can be no doubt of the endogenous production of cholesterol, since Channon (1) points out that on cholesterol-poor diets animals grow and will produce far more cholesterol in the tissues than they receive. Hawk (2) is of the opinion that most of the cholesterol is exogenous, but that under special stress the body may be able to produce endogenous cholesterol. There is as yet, however, no clear conception of the origin of the esters of cholesterol in the body. Morse (3) states: "Bloor believes that much of the digested fat, especially the unsaturated fatty acids, is carried through the blood stream as cholesterol esters, the esterification being accomplished by way of the secondary alcohol." Bloor, Okey, and Corner (4), in a study of the lipoid content of the corpus luteum of the sow, observed that cholesterol esters were found to vary inversely with the activity of the gland, a high content being characteristic of the degenerated organ, and concluded that cholesterol esters seem to be related to inactivity or retrogression.

The fact that cholesterol plays a part in lymphoid defense (Dewey and Nuzum (5), Luden (6)), its ability to protect blood cells from hemolysis, and the universal presence of cholesterol or related sterols in plant and animal cells may lead one to suspect cholesterol to be an element in the nonspecific mechanism of defense in the body. It seemed, therefore, that the possible influence of cholesterol as a defensive agent or index of nonspecific defense should be particularly conspicuous in a chronic infection, such as leprosy, which produces pathological changes in the liver, many tissues of the body, and peripheral nerves. In a study by one of us (7) the albumin-globulin ratio, perhaps also to be included among the nonspecific defense indices, was found to be considerably affected. The hope of detecting a similar role for cholesterol was one of the reasons that the present study was begun.

A second reason was to determine whether the cholesterol metabolism bore any relation to the complement fixation test in leprosy. The fact that the sera of lepers give so high a percentage of positive

reactions with antigens ordinarily used for the Wassermann test seemed to us to be interpreted illogically as indicative of a superimposed or underlying infection with syphilis. We know that the test is not biologically specific and does not represent a true inter-reaction between an antibody and an antigen in a strictly immunologic sense. Kolmer (8) states, in substance, that all definitely known of the reaction is that while lipoidal extracts (antigens) as well as normal and luetic serums may separately absorb or fix small amounts of complement, a mixture of a suitable extract and a syphilitic serum is capable of fixing large amounts of complement.

It occurred to us that cholesterol, which is one of the lipoids, might play a part in the reaction, and if so, this fact could be brought out by doing serial Wassermann tests and parallel cholesterol determinations; then, on tabulating the results, any correlation between the variations in the cholesterol content and the degree of fixation in the Wassermann could be observed.

The 200 patients selected were of various types, duration of leprosy, and state of progression, and their blood was analyzed for total cholesterol and cholesterol esters, and their sera for the Van den Bergh test and the complement fixation.

Control blood and sera were collected from 20 young men and women, employees of this institution, and analyzed coincidentally with the patient's blood and sera.

ANALYTICAL METHODS

Approximately 10 cc of blood were collected for analysis from a cubital vein. The blood was collected after a 16-hour fast, to exclude the effect of digestion from the previous meal. Bloor (9) has found that the postabsorptive condition 8 to 16 hours after the last meal is "practically the only time when the blood is free from the influence of ingested or mobilized fat." Whole blood was used for the cholesterol and cholesterol-ester determinations; and serum, which was removed from the clot from 3 to 4 hours after the specimen had been taken, was used for the Van den Bergh test and the complement fixation. The serum was preserved at a temperature of 6° to 8° C. All analyses were completed within a week.

The total cholesterol was determined according to the method of Bloor (10); the cholesterol esters were determined by the Bloor and Knudson method (11), utilizing for both the Lieberman-Burchard reaction as modified by Mirsky and Bruger (12) for the color development; free cholesterol was determined by subtracting the cholesterol esters from the total cholesterol, the Van den Bergh test, direct and indirect (quoted by Kolmer and Boerner) (13); the complement fixation by Kolmer's quantitative method.

TABLE 1.—*Determination for controls*

	Cholesterol, milligrams per 100 cc of whole blood			
	Total	Free	Ester	
			Amount	Percent
Minimum	133	45	68	45.1
Average	150	64	86	57.6
Maximum	178	95	106	67.8

The general literature on the total cholesterol content of the blood presents results of wide variability, ranging as low as 110 mg, and as high as 250 mg per 100 cc of whole blood, although various textbooks of physiologic chemistry (e. g., Meyers (14)) and Morse (3) state that the normal limits of cholesterol in whole blood are from 140 to 170 mg. Although our figures for the controls (table 1) range from 133 to 178 mg, we have found in an earlier experiment as high as 200 mg in apparently normal individuals. We have therefore considered a blood cholesterol below 130 mg as subnormal (hypocholesterolemia); from 130 to 180 mg as the average normal range; from 180 to 200 mg as suggestive of hypercholesterolemia, but still within the normal limits; and above 200 mg as definitely elevated (hypercholesterolemia). The average figures for cholesterol esters agree with the findings of Bloor and Knudson (11). The Van den Bergh test, direct and indirect, as well as the complement fixation, is negative in all cases.

The data which have been obtained on the whole blood and sera of lepers have been divided into the three stages of activity; namely, those cases showing improvement (table 2), those remaining stationary (table 3), and those cases showing retrogression (table 4).

TABLE 2.—*Stage of activity, improving*

78 CASES

	Cholesterol, milligrams per 100 cc of whole blood			
	Total	Free	Ester	
			Amount	Percent
Minimum	132	28	60	40
Average	182	70	110	60.6
Maximum	320	160	177	83

The results presented in table 2 show that the average findings for the total and free cholesterol, cholesterol esters, and the percentage of esters are slightly higher as compared with the controls, but fall

within the normal range. Of the 78 cases, 63 showed normal values for total cholesterol, while 15 showed a definite hypercholesterolemia. Of the 63 cases showing a normal total cholesterol, 11 showed a definite percentage increase of esters, while in the 15 cases showing a hypercholesterolemia an increase was found in 3 cases The Van den Bergh test was positive in 55 of the cases, and 30 showed a positive complement fixation.

TABLE 3 —*Stage of activity, stationary*

	Cholesterol, milligrams per 100 cc of whole blood			
	Total	Free	Ester	
			Amount	Percent
Minimum	139	21	58	40 7
Average	181	63	117	64 9
Maximum	246	144	177	86 5

The results presented in table 3 show that the average of the findings for the total cholesterol approximates that in table 2. The amount of esters, as well as the percentage of esters, is slightly higher, though within the normal range. Of the 71 cases, 58 showed normal values for total cholesterol, 13 showing a definite hypercholesterolemia. Of the 58 cases showing a normal total cholesterol, 21 have a definite percentage increase of esters, while 4 of those showing a hypercholesterolemia have a high percentage of esters. The Van den Bergh test was positive in 43 cases, and 31 showed a positive complement fixation.

TABLE 4.—*Stage of activity, retrograding*

	Cholesterol, milligrams per 100 cc of whole blood			
	Total	Free	Ester	
			Amount	Percent
Minimum	120	22	72	48 3
Average	175	48	127	72 7
Maximum	295	125	188	88.7

The results presented in table 4 show that the average of the findings for the total and free cholesterol is lower than that in the two preceding tables. The average results of the esters are higher, whereas there was a more striking increase in the percentage of esters

than in those cases showing improvement and remaining stationary (tables 2 and 3).

Of the 51 cases, 38 showed normal total cholesterol values, 11 showed a definite hypercholesterolemia, and 2 cases showed a hypocholesterolemia. Of the 38 cases showing a normal total cholesterol, 29 have a percentage of esters above normal; while of the 11 showing a hypercholesterolemia, 9 have an increase in the percentage of esters. The Van den Bergh was positive in 40 of the cases; while in the complement fixation, 22 were positive.

In the entire series (tables 2, 3, and 4) the total cholesterol, as well as the percentage of esters, fluctuated within comparatively wide limits. The total cholesterol ranged from 120 mg to 320 mg per 100 cc of whole blood; while in the controls, the total cholesterol ranged from 133 mg to 178 mg. The percentage of esters in the patients' blood ranged from 40 to 88.7 percent, as against 45.1 to 67.8 percent in the controls.

Of the 200 cases, 159 showed a normal total cholesterol; and of these, 61 had an increase in the percentage of esters. A definite hypercholesterolemia was found in 39 of the cases; and of these, 16 had an increase in the percentage of esters. There were only two cases showing a hypocholesterolemia.

The Van den Bergh test was positive in 138 of the cases. Of the complement fixation, 83 were found to be positive.

The duration of leprosy ranged from 5 months to 30 years.

In view of the close association of cholesterol with lipoid nephrosis, and of the findings of Epstein (15), who has attempted to distinguish as a pathological entity a condition which runs a chronic course and is characterized by oedema, excessive albuminuria, high cholesterol, and the absence of any marked nitrogen retention of the blood, determinations have been made of the blood urea nitrogen on 18 of the patients who showed a hypercholesterolemia, and urinalyses on 39 of the patients (total number showing a hypercholesterolemia) to determine any nitrogen retention and if albuminuria was present.

The results showed that 12 of the 18 cases had a urea nitrogen retention ranging from 22 to 40 mg per 100 cc of whole blood. Of these, only 1 case showed albuminuria. The urinalyses were negative for sugar and albumin in 38 of the 39 cases. No definite relation existed between the hypercholesterolemia and the degree of urea nitrogen retention in the cases studied. The increase in the cholesterol content in the above series is probably not associated with lipoid nephrosis.

It was thought that the administration of chaulmoogra oil, or its preparations, in large doses, such as given in the treatment of leprosy, might in some way affect the lipoid metabolism of the body, and any alteration caused by their administration might be reflected in the

cholesterol content of the blood. An investigation was made and it was found that neither the oral nor intramuscular injections of the oil or its esters had any influence on the total, free, or cholesterol esters.

TABLE 5.—*Cholesterol and its relation to the complement fixation*

	Cholesterol			
	Total	Free	Esters	
			Amount	Percent
Negative (117 cases)				
Minimum	129	22	60	40.0
Average	180	64	117	64.8
Maximum	205	144	177	86.2
One plus (25 cases)				
Minimum	120	24	70	40.0
Average	179	65	114	63.9
Maximum	206	116	188	88.7
Two plus (25 cases)				
Minimum	133	21	80	47.6
Average	169	55	114	67.6
Maximum	215	88	160	86.5
Three plus (20 cases)				
Minimum	128	23	86	48.0
Average	177	57	120	67.9
Maximum	2[illegible]0	104	186	82.7
Four plus (13 cases)				
Minimum	13[illegible]	32	72	45.0
Average	191	70	121	63.5
Maximum	320	1[illegible]0	177	83.1

Table 5 gives the minimum average and maximum findings in the patients who have a negative complement fixation, those that are 1 plus, 2 plus, 3 plus, and 4 plus. The results show very little variation between the groups into which the cases have been divided. The average of findings for total cholesterol is highest in those cases that are 4 plus, but falls within the normal average range. In some cases the cholesterol values parallel roughly the degree of fixation, while in others no such correlation could be found.

DISCUSSION

Regarding the fate of cholesterol in the body, there is some evidence that it may be oxidized, and also that it may be a source of the bile acids. Ordinarily, however, the greatest part, if not all, of the excess

of cholesterol is excreted in the feces or by the skin after partly undergoing slight oxidation or reduction. It is excreted in the intestine practically entirely free, while in the skin secretions it appears almost entirely as esters of the fatty acids. The data obtained from the 200 cases show that the cholesterol esters may be considerably higher in lepers than in normal individuals. It is apparent, too, that this increase is associated with retrogression. We know that leprosy produces pathological changes in many tissues of the body. Degenerative processes manifest themselves in various organs, such as the liver, spleen, and kidney. The prominent clinical manifestations occurring in the skin may be functional, structural, or circulatory—functional, as the various types of anesthesia; structural, as the various types of pigmentation, atrophy, infiltration, suppuration; and circulatory, as hyperemia, ischemia, or oedema.

When one considers the excessive breakdown of tissues, and the above cited functional, structural, and circulatory changes of the skin, it seems logical that there should be a partial suppression of the excretory function of the skin. We know that in addition to the kidneys, lungs, and intestinal tract, the skin also plays a part in removing some of the deleterious or used-up products from the body. If there is a reduced capacity to excrete the end products, there will be an accumulation of them in the blood. Also, while it may be that the excretion of sterols is a mechanism of the body for getting rid of a waste product of metabolism, it is also possible that the constant secretion of sterols on the surfaces of the body is necessary to preserve their normal physical, chemical, and immunologic status; and this is not maintained in leprosy, as the skin of the patient is not supple and soft.

It is impossible at this time to explain satisfactorily the interrelation between leprosy and the increase in cholesterol esters, as most phases of cholesterol metabolism are still awaiting an intelligent solution, but it seems from our findings that the blood cholesterol ester changes associated with leprosy appear to be the result of a widespread disorder of function of the body tissues, involving the skin, sweat and sebaceous glands, and probably the internal organs.

SUMMARY

Blood from 20 normal, healthy, young men and women was examined for total and free cholesterol, cholesterol esters, and the percentage of esters; and sera were used for the Van den Bergh test, direct and indirect, and the complement fixation test. Blood from 200 lepers, representing the various types and stages of progression and activity of the disease, was similarly examined.

The esters, as well as the percentage of esters, averaged higher in the lepers than in the normal controls, the highest being found in the group retrograding.

A definite hypercholesterolemia was found in 39 of the cases. A study of the blood urea nitrogen on 18 of the cases was made, and urinalyses on the 39 cases. The results showed no definite relation between the hypercholesterolemia and the degree of nitrogen retention. Albuminuria was present in one case. The increase of cholesterol in these cases is probably not associated with lipoid nephrosis, but with other metabolic disturbances.

Serum bilirubin was determined qualitatively and quantitatively, and was found to be positive in 138 cases. The qualitative was of the delayed type, showing the possibility of early hepatic lesions rather than duct occlusion. The quantitative showing hyperbilirubinemia fell in the zone of latent jaundice.

A study of serial complement fixation tests with parallel cholesterol determinations on the blood was made. In some cases, the cholesterol values parallel roughly the degree of fixation, while in others no such correlation could be found. The degree of fixation seems to be independent of the cholesterol content of the blood.

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COURT DECISION ON PUBLIC HEALTH

Law regulating barbering upheld in action seeking to enjoin enforcement.—(South Dakota Supreme Court; *Mundell* v. *Graph et al.*, 256 N. W. 121; decided July 30, 1934.) The plaintiff, a barber, refused to secure a renewal or restoration of his certificate of registration under the South Dakota act regulating the practice of barbering upon the broad ground that the whole law was unconstitutional. He commenced an action asking that the State barber board and certain other officials be permanently enjoined from enforcing the provisions of the barber law and from interfering with or arresting him on account of his noncompliance therewith.

In disposing of certain points raised against the law on the ground that it was a tax measure, the supreme court said that "it is plain beyond possibility of controversy that the statute was intended to be and is an exercise of the police power and not of the taxing power" and that "Constitutional restrictions applicable solely to the legislative exercise of the taxing power are not pertinent here."

It was also claimed by the plaintiff that the act was not sustainable as a health measure. In entering upon a consideration of this contention the court stated:

> That the business of barbering so directly affects the health and welfare of the public as to be subject to control and regulation under the police power appears universally to be held, so far as we have been able to discover, in every State where the question has been presented. * * *

The court declared itself satisfied that the act was an exercise of the police power and that the occupation of barbering was subject to regulation under the police power. The opinion closed with the following language:

> The statute here involved contains a "saving clause" (sec. 23) similar to that considered in the case of *State ex rel. Botkin* v. *Welsh* (1933) 61 S. D. —, 251 N. W. 189, at page 215, providing that partial invalidity shall not destroy the act. Many of the objections urged by respondent he is not in position to present in this case, and it is not here necessary for us to examine and review every section or every clause of the statute and determine the individual validity thereof. Conceivably various provisions of the law might be held unconstitutional and yet the act could stand as a whole. The validity of specific portions of the act will be reviewed by this court if and when they are presented here by a person who is being adversely affected by them. Respondent has already done

everything the act requires to entitle him to his certificate save only to submit proof of his present freedom from infectious and contagious disease and pay a fee. He makes no allegation that either of those two requirements is in itself unreasonable or arbitrary or unconstitutional, and he must therefore stand or fall on the proposition that the statute is so infirm as to be entirely invalid Whether every specific provision of the statute is in all respects valid and enforceable according to the terms thereof we have made no investigation and we do not undertake to determine in this case. We are satisfied that the act is an exercise of the police power and that the business or occupation of barbering is subject to regulation and control under the police power and that, after eliminating all portions of the act, the validity of which might be at all questionable, a complete workable and constitutional whole would remain which would have to be sustained in the light of the legislative declaration as to its intention in case of partial invalidity. That being true, the present attack upon the statute by this respondent, which is bottomed upon establishing invalidity so extensive as to destroy the whole law, must fail.

DEATHS DURING WEEK ENDED DEC. 22, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce

	Week ended Dec 22, 1934	Corresponding week, 1933
Data from 86 large cities of the United States:		
Total deaths	9,019	8,566
Deaths per 1,000 population, annual basis	12 7	12.0
Deaths under 1 year of age	584	567
Deaths under 1 year of age per 1,000 estimated live births	55	[1] 49
Deaths per 1,000 population, annual basis, first 51 weeks of year	11.3	10.9
Data from industrial insurance companies:		
Policies in force	67,079,418	67,201,366
Number of death claims	13,066	13,664
Death claims per 1,000 policies in force, annual rate	10 2	10.6
Death claims per 1,000 policies, first 51 weeks of year, annual rate	9.8	9.8

[1] Data for 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Dec. 29, 1934, and Dec. 30, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 29, 1934, and Dec. 30, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933
New England States:								
Maine			2		3		1	0
New Hampshire					21	165	0	0
Vermont	1				2	40	0	0
Massachusetts	17	18			112	367	1	0
Rhode Island	6	3			6	2	0	0
Connecticut	1	7	81	23	278	3	0	0
Middle Atlantic States:								
New York	38	52	[1] 70	[1] 14	378	437	2	0
New Jersey	33	30	340	18	48	129	2	0
Pennsylvania	42	36			815	309	1	5
East North Central States:								
Ohio	07	101	360	84	435	136	7	1
Indiana	39	39	50	63	211	108	1	0
Illinois	73	53	57	27	1,056	53	7	7
Michigan	16	11	8		101	16	2	2
Wisconsin	6	5	25	30	369	168	4	1
West North Central States:								
Minnesota	13	6		2	298	14	0	0
Iowa [4]	7	13	2	3	917	51	0	1
Missouri	37	45	80	10	213	158	3	0
North Dakota	16	4	32		126	62	1	1
South Dakota		7			18	197	0	0
Nebraska	11	13			44	8	3	0
Kansas	9	31	3		327	24	2	0
South Atlantic States:								
Delaware	3	3	4	2	2	13	0	0
Maryland [3]	7	15	115	30	42	18	0	1
District of Columbia	5	9	3	1	4	48	1	0
Virginia	30	55			112	109	2	1
West Virginia	29	32	13	60	237	18	0	3
North Carolina [3]	17	34	164	18	503	706	1	1
South Carolina	5	7	1,086	288	8	75	0	0
Georgia [3 4]	20	9	531		9	291	2	2
Florida	10	11	1	4	7	27	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 29, 1934, and Dec. 30, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933
East South Central States:								
Kentucky	36	20	23	12	140	23	1	0
Tennessee	32	26	79	53	11	148	0	0
Alabama [3]	28	30	258	17	174	64	4	1
Mississippi [3]	8	9					1	1
West South Central States:								
Arkansas	15	19	16	44	18	63	0	0
Louisiana	19	49	6	1	23		1	0
Oklahoma [5]	17	35	123	109	4	91	1	0
Texas [3]	67	198	208	138	32	174	1	0
Mountain States:								
Montana	10	2	5	7	68	3	0	0
Idaho					3	1	1	0
Wyoming	2				5	107	0	0
Colorado	12	3			309	5	1	0
New Mexico	3	6	1	1	31	31	1	0
Arizona	1	4	32	40	16	4	1	0
Utah			4		16	429	0	0
Pacific States:								
Washington	1	3	1	3	69	201	1	0
Oregon	1	7	74	46	13	19	0	0
California	48	13	42	10	66	326	5	3
Total	888	1,093	3,975	1,158	7,703	5,861	62	31

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933
New England States:								
Maine	0	0	18	6	0	0	4	3
New Hampshire	0	0	19	8	0	0	1	0
Vermont	0	0	17	19	0	0	0	0
Massachusetts	0	0	145	179	0	0	2	4
Rhode Island	0	0	12	10	0	0	0	1
Connecticut	0	0	46	48	0	0	1	1
Middle Atlantic States:								
New York	1	2	450	420	0	0	7	9
New Jersey	1	1	104	135	0	0	4	4
Pennsylvania	1	1	361	480	0	0	7	16
East North Central States:								
Ohio	2	4	805	517	1	0	4	4
Indiana	0	0	202	167	0	0	7	5
Illinois	1	3	610	451	4	0	11	25
Michigan	0	0	276	124	1	1	0	7
Wisconsin	0	2	375	154	19	35	0	0
West North Central States:								
Minnesota	1	1	106	46	6	2	1	2
Iowa [3]	0	0	64	65	0	7	4	0
Missouri	0	0	57	77	0	5	9	5
North Dakota	1	0	69	18	4	0	0	0
South Dakota	0	0	13	5	5	0	0	0
Nebraska	1	2	30	35	10	6	0	1
Kansas	0	0	67	94	2	1	2	2
South Atlantic States:								
Delaware	0	0	7	7	0	0	0	0
Maryland [3]	0	0	101	61	0	0	1	4
District of Columbia	1	0	28	19	0	0	1	2
Virginia	0	1	86	95	0	0	7	7
West Virginia	0	1	125	73	0	4	1	1
North Carolina [3]	0	1	42	63	0	1	11	1
South Carolina	0	2	8	6	1	0	5	1
Georgia [3, 4]	0	1	16	8	0	0	7	3
Florida	2	0	16	1	1	0	2	4

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 29, 1934, and Dec. 30, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933
East South Central States:								
Kentucky	0	0	57	21	0	0	4	8
Tennessee	0	0	61	72	2	5	5	3
Alabama [3]	0	0	12	25	1	1	10	9
Mississippi [2]	1	1	17	17	0	0	4	1
West South Central States:								
Arkansas	1	0	12	14	5	4	10	1
Louisiana	0	1	22	29	4	0	11	3
Oklahoma [5]	2	0	46	53	1	1	12	3
Texas [3]	1	0	50	110	5	18	19	20
Mountain States:								
Montana	0	0	10	11	0	0	0	2
Idaho	0	0	2	6	0	2	0	0
Wyoming	0	0	13	15	4	0	0	0
Colorado	0	0	179	11	1	9	0	1
New Mexico	0	0	17	5	0	0	2	9
Arizona	1	1	14	16	0	0	4	2
Utah	0	0	53	17	0	13	0	0
Pacific States:								
Washington	0	2	27	26	29	5	2	0
Oregon	2	0	62	38	1	5	0	6
California	26	2	170	129	6	5	5	8
Total	46	29	5,099	4,036	113	125	187	188

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Dec. 29, 1934, 27 cases, as follows: North Carolina, 1; Georgia, 18; Alabama, 1; Texas, 7.
[4] Dengue, week ended Dec. 29, 1934, 36 cases in Georgia.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
November 1934										
Arizona	3	22	93		55	1	9	172	4	30
Idaho		2	8		32		1	29	2	5
Kansas	5	68	2		534		10	251	8	8
Louisiana	1	113	22	153	22	20	6	90	2	43
Maryland		112	29	2	155	3	4	416	0	31
Montana	1	43	33		399		7	63	0	5
Nevada		4	13	1	1		1	11	0	3
North Dakota	2	52	2		220		1	137		4
Oregon	2	2	114	2	52		12	219	0	7
South Dakota	1	18	14		103		0	93	55	5
Virginia	8	356	126	23	628	3	4	540	0	31
Washington	2	21	77		411		48	186	114	13
Wisconsin	2	30	21		813		7	1,540	88	12
Wyoming	2	5			16		1	82	8	0

November 1934

	Cases
Actinomycosis:	
Washington	3
Chicken pox:	
Arizona	56
Idaho	53
Kansas	588
Louisiana	8
Maryland	318
Montana	168
Nevada	22
North Dakota	203
Oregon	172
South Dakota	88
Virginia	192
Washington	442
Wisconsin	2,630
Wyoming	37
Conjunctivitis:	
Arizona	4
Devil's grippe (Dabney's grippe):	
Virginia	3
Diarrhea:	
Maryland	14
Diarrhea and dysentery:	
Virginia	84
Dysentery:	
Arizona	15
Louisiana (amoebic)	5
Louisiana (bacillary)	4
Maryland	5
Oregon	1
Washington (amoebic)	1
Washington (bacillary)	1
Food poisoning:	
Montana	1
German measles:	
Arizona	26
Kansas	24
Maryland	8
Montana	73
Washington	59
Hookworm disease:	
Louisiana	19
Impetigo contagiosa:	
Kansas	12
Maryland	81
Montana	29
Oregon	54
Washington	1
Jaundice, epidemic:	
Montana	1
Leprosy:	
Louisiana	2

November 1934

	Cases
Lethargic encephalitis:	
Kansas	2
Louisiana	1
Montana	1
North Dakota	1
Washington	1
Mumps:	
Arizona	9
Kansas	121
Maryland	37
Montana	132
North Dakota	8
Oregon	156
South Dakota	50
Virginia	126
Washington	174
Wisconsin	323
Wyoming	1
Ophthalmia neonatorum:	
Maryland	4
South Dakota	1
Virginia	1
Paratyphoid fever:	
Kansas	1
Louisiana	1
Virginia	3
Puerperal septicemia:	
Washington	2
Rabies in animals:	
Kansas	6
Louisiana	15
Maryland	1
Oregon	1
Washington	8
Rabies in man:	
Louisiana	1
Rocky Mountain spotted fever:	
South Dakota	2
Virginia	1
Scabies:	
Kansas	7
Maryland	4
Montana	9
Oregon	44
Septic sore throat:	
Arizona	2
Idaho	3
Kansas	3
Louisiana	4
Maryland	10
Montana	1
Oregon	2
Virginia	14

November 1934

	Cases
Septic sore throat—Contd.	
Wisconsin	4
Wyoming	2
Tetanus:	
Kansas	2
Louisiana	5
South Dakota	1
Trachoma:	
Arizona	43
Montana	4
South Dakota	2
Tularaemia:	
Louisiana	1
Maryland	1
Nevada	1
Virginia	4
Wisconsin	7
Typhus fever:	
Louisiana	2
Maryland	1
Virginia	1
Undulant fever:	
Kansas	6
Louisiana	2
Maryland	7
Montana	1
Oregon	4
South Dakota	1
Virginia	2
Washington	3
Wisconsin	3
Vincent's infection:	
Kansas	10
Maryland	15
Montana	1
North Dakota	5
Oregon	6
Whooping cough:	
Arizona	49
Idaho	35
Kansas	243
Louisiana	12
Maryland	184
Montana	71
North Dakota	191
Oregon	44
South Dakota	64
Virginia	455
Washington	114
Wisconsin	1,011
Wyoming	17

WEEKLY REPORTS FROM CITIES

City reports for week ended Dec. 22, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0			0		5	0		0	3	19
New Hampshire:											
Concord	0			0		0	0		0	0	13
Nashua	0			0		1	0		0	0	
Vermont:											
Barre	0		0	0	0	0	0	1	0	5	3
Burlington	0		0	0	0	3	0	0	0	0	12
Massachusetts:											
Boston	2		0	8	18	31	0	6	1	23	214
Fall River	1		0	47	1	0	0	1	1	1	28
Springfield	0		0	4	1	5	0	0	0	1	33
Worcester	1		0	0	2	12	0	2	0	3	44

City reports for week ended Dec. 22, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Rhode Island:											
Pawtucket	0	---	------	0	------	0	0	------	0	0	17
Providence	0	------	0	0	11	3	0	1	0	15	47
Connecticut:											
Bridgeport	0	------	0	0	3	2	0	3	0	1	29
Hartford	0	------	0	153	2	5	0	0	0	3	35
New York:											
Buffalo	0	------	0	20	16	45	0	3	0	39	139
New York	48	65	16	71	203	104	0	11	5	256	1,686
Rochester	0	------	0	121	4	10	0	1	0	10	62
Syracuse	0	------	0	1	3	4	0	0	0	12	53
New Jersey:											
Camden	1	5	2	0	3	5	0	0	0	3	32
Newark	1	104	2	3	12	10	0	3	0	38	115
Trenton	1	6	0	2	3	11	0	1	0	4	43
Pennsylvania:											
Philadelphia	16	24	7	5	58	71	0	32	0	99	589
Pittsburgh	3	4	1	49	13	40	0	4	0	31	160
Reading	2	------	2	1	1	4	0	0	0	12	27
Scranton	1	------	------	11	------	2	0	------	0	7	------
Ohio:											
Cincinnati	12	------	2	3	9	31	0	11	0	2	171
Cleveland	7	125	0	13	12	38	0	7	0	47	170
Columbus	8	------	0	7	4	30	0	7	0	4	105
Toledo	1	1	0	32	5	20	0	2	0	14	72
Indiana:											
Fort Wayne	3	------	0	2	3	4	0	1	0	0	28
Indianapolis	1	------	0	0	23	20	0	1	0	8	------
South Bend	0	------	0	17	2	3	0	0	0	0	19
Terre Haute	0	------	2	0	1	0	0	0	0	0	25
Illinois:											
Chicago	7	22	12	95	79	297	0	30	3	40	783
Springfield	0	------	0	0	4	12	0	1	1	3	22
Michigan:											
Detroit	5	8	3	33	21	81	0	29	0	37	288
Flint	3	------	0	1	1	12	0	3	2	5	30
Grand Rapids	0	------	0	1	2	9	0	1	0	7	29
Wisconsin:											
Kenosha	0	------	0	1	1	8	0	0	0	15	5
Madison	0	------	0	15	1	4	0	0	0	2	16
Milwaukee	0	1	1	83	6	243	0	3	0	41	89
Racine	0	------	0	0	0	6	0	1	0	0	7
Superior	0	1	1	39	1	1	1	0	0	0	4
Minnesota:											
Duluth	0	------	0	194	2	2	0	1	0	0	19
Minneapolis	1	------	1	446	10	37	0	1	1	8	103
St. Paul	0	------	0	9	10	11	0	4	0	5	80
Iowa:											
Davenport	0	------	------	20	------	1	0	------	0	0	------
Des Moines	1	------	0	0	0	8	0	0	0	0	46
Sioux City	0	------	0	17	0	3	0	0	0	4	0
Waterloo	3	------	0	330	0	8	0	0	0	2	1
Missouri:											
Kansas City	1	------	0	1	16	9	0	8	0	0	123
St. Joseph	3	------	0	1	4	0	0	1	0	1	28
St. Louis	14	4	0	2	12	17	0	6	0	7	229
North Dakota:											
Fargo	0	------	0	0	0	3	0	0	0	2	3
Grand Forks	0	------	------	3	------	6	0	------	0	0	------
South Dakota:											
Aberdeen	0	------	------	6	------	0	1	------	0	1	------
Nebraska:											
Omaha	3	------	1	1	4	14	0	5	0	0	56
Kansas:											
Topeka	0	------	0	0	4	3	0	1	0	4	27
Wichita	4	------	0	2	8	0	0	0	0	0	41
Delaware:											
Wilmington	0	------	0	0	9	1	0	2	0	0	31
Maryland:											
Baltimore	5	17	2	1	18	43	0	14	1	25	217
Cumberland	0	------	0	4	2	4	0	0	0	0	12
Frederick	0	------	0	0	0	0	0	0	0	0	2
District of Columbia:											
Washington	11	9	4	1	14	29	0	6	0	3	180

City reports for week ended Dec. 22, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Virginia:											
Lynchburg	0	------	0	5	2	8	0	1	1	4	11
Norfolk	0	------	0	0	4	1	0	2	0	10	35
Richmond	1	------	0	5	2	11	0	2	0	0	46
Roanoke	2	------	0	0	0	5	0	3	0	0	12
West Virginia:											
Charleston	4	------	0	8	5	7	0	1	0	3	26
Huntington	1	------	------	1	------	6	0	------	0	0	------
Wheeling	0	------	0	2	1	19	0	0	0	11	18
North Carolina:											
Raleigh	1	------	0	1	2	1	0	3	0	1	14
Wilmington	0	------	0	0	0	1	0	0	0	0	15
Winston-Salem	1	------	0	1	1	4	0	0	0	21	11
South Carolina:											
Charleston	1	47	0	0	2	1	0	1	0	1	19
Columbia	0	------	0	0	3	0	0	1	0	0	24
Greenville	0	------	0	0	0	0	0	1	0	2	18
Georgia:											
Atlanta	8	112	2	0	7	3	0	7	0	5	97
Brunswick	0	------	0	0	0	1	0	0	0	0	3
Savannah	0	19	0	0	3	0	0	1	0	3	35
Florida:											
Miami	1	------	0	0	0	6	0	1	0	3	37
Tampa	3	------	0	0	1	1	0	1	0	0	33
Kentucky:											
Ashland	0	7	0	0	0	1	0	0	0	0	0
Lexington	2	------	0	0	1	2	0	1	0	0	17
Louisville	3	5	2	8	7	17	0	4	0	5	72
Tennessee:											
Memphis	3	------	2	1	14	7	0	5	1	5	112
Nashville	4	------	0	0	0	10	0	2	0	4	59
Alabama:											
Birmingham	3	3	1	1	5	2	0	2	2	3	52
Mobile	0	------	3	0	3	1	0	1	0	0	19
Montgomery	8	------	------	0	------	0	0	------	0	0	------
Arkansas:											
Fort Smith	0	------	------	0	------	0	0	------	0	4	------
Little Rock	0	------	0	0	3	1	0	1	0	0	4
Louisiana:											
New Orleans	19	4	5	1	21	6	0	12	7	0	197
Shreveport	0	------	0	1	3	1	0	0	0	0	37
Oklahoma:											
Tulsa	1	------	0	1	0	2	0	0	1	2	1
Texas:											
Dallas	10	2	2	0	7	5	0	1	0	1	64
Fort Worth	2	------	0	0	6	3	0	2	1	0	40
Galveston	3	------	0	0	6	0	0	0	0	0	21
Houston	5	------	0	0	7	0	1	2	0	0	90
San Antonio	4	------	4	0	14	0	0	6	1	0	86
Montana:											
Billings	3	------	0	11	0	2	0	0	0	0	6
Great Falls	1	------	0	0	1	0	0	0	0	0	6
Helena	0	------	0	21	0	1	0	0	0	0	1
Missoula	0	------	0	0	1	1	0	0	0	0	6
Idaho:											
Boise	0	------	0	1	0	0	0	0	0	0	4
Colorado:											
Denver	0	------	1	220	11	112	2	1	1	6	94
Pueblo	4	------	0	0	2	5	0	1	0	0	13
New Mexico:											
Albuquerque	0	------	0	20	0	2	1	0	0	0	7
Arizona:											
Utah:											
Nevada:											
Reno	0	------	0	0	1	0	0	0	0	0	5
Washington:											
Seattle	0	------	------	0	------	1	4	------	1	1	------
Spokane	0	2	2	15	6	5	0	0	0	0	38
Tacoma	1	------	0	0	3	1	5	1	0	0	29
Oregon:											
Portland	0	------	1	4	6	8	0	1	0	0	78
Salem	0	3	------	0	------	2	0	------	0	0	------
California:											
Los Angeles	19	25	1	9	15	38	9	14	0	4	316
Sacramento	2	------	0	0	2	3	0	2	1	0	40
San Francisco	0	6	3	4	17	15	0	11	0	15	190

City reports for week ended Dec. 22, 1934—Continued

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Polio-myelitis cases	State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Polio-myelitis cases
Massachusetts:				Georgia:			
Boston	2	0	0	Atlanta	1	0	0
New York:				Kentucky:			
New York	3	2	1	Louisville	0	1	0
Pennsylvania:				Tennessee:			
Philadelphia	3	1	0	Memphis	0	1	0
Ohio:				Louisiana:			
Cleveland	1	0	0	New Orleans	2	1	0
Columbus	1	1	0	Texas:			
Illinois:				Dallas	1	1	0
Chicago	6	1	0	California:			
Michigan:				Los Angeles	0	0	2
Detroit	0	1	0	Sacramento	0	0	2
Wisconsin:							
Milwaukee	0	0	1				
North Dakota:							
Fargo	1	0	0				

Dengue.—Cases: Savannah, 31; Tampa, 1.
Lethargic encephalitis.—Cases: St. Louis, 1; Topeka, 1; Dallas, 1.
Pellagra.—Cases: Charleston, S. C., 1; Savannah, 3; Miami, 1; New Orleans, 1.
Typhus fever.—Cases: Wilmington, N. C., 1; Atlanta, 2; Savannah, 2; Montgomery, 2.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended December 15, 1934.—During the 2 weeks ended December 15, 1934, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis					3					3
Chicken pox		49		590	955	140	225	21	173	2,156
Diphtheria		8	2	49	23	53	7	2	3	117
Dysentery				2		1	1			4
Erysipelas				6	5	4	1	2	4	22
Influenza		4		3	15		2		161	185
Lethargic encephalitis						1				1
Measles		403	3	413	263	447	362	16	12	1,910
Mumps					216	21	9	15	82	313
Paratyphoid fever		1								1
Pneumonia		1			17		4		23	45
Poliomyelitis		1		1	7		1		1	11
Scarlet fever	7	9	19	274	359	89	53	22	67	899
Trachoma					1				15	16
Tuberculosis	1	2	20	114	64	6	55	4	39	305
Typhoid fever		2	4	37	16	10	2		4	75
Undulant fever					2		4			6
Whooping cough		50	10	370	303	20	36	34	43	866

CUBA

Habana—Communicable diseases—4 weeks ended December 22, 1934.—During the 4 weeks ended December 22, 1934, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	2	1	Tuberculosis	4	4
Malaria	[1] 51		Typhoid fever	[1] 15	3

[1] Includes imported cases.

Provinces—Notifiable diseases—4 weeks ended November 17, 1934.—During the 4 weeks ended November 17, 1934, cases of certain notifiable diseases were reported in the provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	1			7		3	11
Cerebrospinal meningitis		1					1
Chicken pox				2			2
Diphtheria		1	1	5			7
Hookworm disease				6			6
Leprosy				4		22	26
Malaria	805	23	239	2,522	1,855	3,480	8,924
Measles		4		38	1		43
Poliomyelitis	11	5	2	5			23
Scarlet fever		2		1			3
Tuberculosis	4	7	21	80	7	54	173
Typhoid fever	14	9	30	83	33	11	180

YUGOSLAVIA

Communicable diseases—November 1934.—During the month of November 1934 certain communicable diseases were reported in Yugoslavia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	43	6	Poliomyelitis	4	
Cerebrospinal meningitis	6	3	Scarlet fever	553	10
Diphtheria and croup	1,949	210	Sepsis	13	6
Dysentery	188	33	Tetanus	30	20
Erysipelas	224	10	Typhoid fever	1,232	148
Measles	848	35	Typhus fever	10	2
Paratyphoid fever	23	2			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Dec. 28, 1934, pp. 1585–1599. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Jan. 25, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Plague

Argentina—Santiago del Estero Province—Lavalle.—According to a newspaper report of December 4, 1934, one suspected case of bubonic plague had occurred at Lavalle, Santiago del Estero Province, Argentina. Precautionary measures were being taken.

Smallpox

Mexico—Coahuila—Allende.—A report dated December 18, 1934, states that 25 cases of smallpox had occurred at Allende, Coahuila, Mexico.

Palestine—Haifa.—During the week ended December 22, 1934, one imported case of smallpox was reported at Haifa, Palestine.

UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

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PUBLIC HEALTH REPORTS

VOL. 50 — JANUARY 18, 1935 — NO. 3

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES [1]

December 2-29, 1934

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease."

Influenza.—An increase of influenza cases was reported from all sections of the country. For 42 States, the District of Columbia, and New York City 9,130 cases were reported for the 4 weeks ended December 29; the weekly number of cases increased from 1,046 to 3,970 within the 4 weeks. For the week ended January 5, 1935, there were 6,965 cases, an increase of approximately 3,000 over the preceding week.

As compared with recent years, the incidence for the current 4-week period was about twice that for the corresponding period in 1933 and 1930 and 2.6 times that in 1931. In each of those years the influenza situation was quite normal at this time. In 1932 an epidemic which started in the West and South in November and extended into all areas reached its peak during this period.

Table 1 shows by geographic sections the number of cases reported for recent weeks of this winter, with comparative figures for corresponding weeks in the 3 preceding winters. An increase over last year was reported in each geographic group, but in some groups it was due to a sharp increase in only one or two States. The disease has been most prevalent in the eastern half of the country, particularly in the States along the Atlantic Coast. The increase in the Mountain and Pacific area was negligible.

Mortality records indicate that the cases thus far have been of a mild type, as the death rate in large cities for the current period was about the same as in nonepidemic years. The rates for the last 2

[1] From the Office of Statistical Investigations, U. S. Public Health Service. The numbers of States included for the various diseases are as follows: Typhoid fever, 48, poliomyelitis, 48, meningococcus meningitis, 48, smallpox, 48, measles, 47, diphtheria, 48, scarlet fever, 48, influenza, 43 States and New York City. The District of Columbia is counted as a State in these reports. These summaries include only the 8 important communicable diseases for which the Public Health Service receives regular weekly reports from the State health officers.

weeks of the period (12.7 and 12.8) were slightly above the seasonal expectancy, and in the week ending January 5 the rate was 13.5 per 1,000 (annual basis)—a definite increase, but not of the magnitude to indicate a severe epidemic.

TABLE 1.—*Numbers of influenza cases reported in different geographic sections during recent weeks of the winter of 1934–35 and during corresponding weeks of the 3 preceding winters*

Year	Week ended—								
	Nov. 10	Nov. 17	Nov. 24	Dec. 1	Dec. 8	Dec. 15	Dec. 22	Dec. 29	Jan. 5
Total:									
1934–35	760	1,011	882	1,068	1,046	1,671	2,438	3,975	6,965
1933–34	999	1,009	1,107	1,481	1,431	1,311	1,105	1,158	2,051
1932–33	1,708	3,086	6,306	14,291	26,144	37,770	48,624	62,323	64,318
1931–32	1,052	873	828	859	1,009	888	628	1,122	1,242
New England and Middle Atlantic:									
1934–35	23	39	68	82	103	132	396	519	641
1933–34	40	34	39	55	60	77	54	55	83
1932–33	24	74	36	54	65	101	263	1,080	2,127
1931–32	30	36	30	46	33	45	35	52	76
East North Central:									
1934–35	40	148	71	125	81	161	133	500	394
1933–34	189	82	86	246	100	194	110	204	143
1932–33	217	131	135	384	901	2,057	2,403	5,513	8,947
1931–32	58	30	61	29	147	28	51	106	89
West North Central:									
1934–35	39	38	42	73	56	120	105	117	556
1933–34	9	22	17	9	14	10	11	15	27
1932–33	2	10	11	182	170	272	[1] 1,586	[1] 8,930	[1] 4,313
1931–32	[2] 322	7	21	10	8	9	9	10	20
South Atlantic:									
1934–35	284	370	319	282	331	548	835	1,967	3,514
1933–34	418	451	484	678	689	511	547	403	1,102
1932–33	432	540	559	918	3,361	5,928	4,809	7,904	13,191
1931–32	461	569	544	540	530	507	322	540	608
East and West South Central:									
1934–35	331	338	283	420	358	597	856	713	1,558
1933–34	274	319	289	361	441	424	271	374	568
1932–33	262	679	3,029	6,231	18,489	25,358	31,912	27,713	27,720
1931–32	96	119	91	117	157	125	93	178	256
Mountain and Pacific:									
1934–35	43	78	90	86	117	113	113	159	302
1933–34	60	101	172	137	127	95	112	107	128
1932–33	771	1,052	2,536	6,522	3,158	4,054	7,651	11,183	8,020
1931–32	85	112	81	117	134	174	118	236	193

[1] The following numbers of cases, not included here, were reported in Kansas in response to a special inquiry: Week ended Dec. 24, 1932, 78,624; Dec. 31, 27,779; Jan 7, 1933, 7,923.

[2] Includes 319 cases in Missouri; for the preceding week 14 cases were reported from Missouri, and the following week only 4 cases.

Measles.—A continued seasonal increase of measles was apparent in all sections of the country. For the 4 weeks ended December 29 the number of cases reported was 30,920, approximately 13,000 more than occurred during the preceding 4-week period. Compared with recent years measles maintained a high level. For this period in the years 1933, 1932, and 1931 the numbers of cases were 20,496, 13,942, and 14,298, respectively. The disease was most prevalent in the North Central sections. In the East North Central area the current incidence (7,458 cases) was about five times that for the corresponding period last year, while in the West North Central region the number (7,805) was almost four times last year's figure. The New

England and Middle Atlantic areas reported a 30-percent increase over last year. The South Atlantic, South Central, and Mountain and Pacific areas each reported fewer cases than last year, but the numbers were considerably above those for preceding years.

Typhoid fever. For the 4 weeks ended December 29, 1,039 cases of typhoid fever were reported, as compared with 995, 680, and 1,175 for the corresponding period in the years 1933, 1932, and 1931, respectively. The disease was more prevalent than last year in the New England and Middle Atlantic, East North Central, and South Central States; it was less prevalent in the South Atlantic and Pacific areas and approximately the same as last year in the West North Central and Mountain sections.

Smallpox. -The 518 cases of smallpox reported for the current 4-week period represented only a normal seasonal increase. In relation to recent years the current incidence was approximately the same as that for the corresponding period in each of the 2 preceding years. For this period in 1931 and 1930 the numbers of cases were 1,238 and 2,172, respectively. Minnesota (31 cases) and Nebraska (53 cases) in the West North Central section, Virginia (25 cases) in the South Atlantic area, and Washington (152 cases) on the Pacific coast seemed mostly responsible for significant increases over last year in those areas. In the East North Central, West South Central, and Mountain regions the incidence dropped about 50 percent from last year's figures, while the East South Central States reported approximately the same incidence as last year. No cases were reported from the New England and Middle Atlantic States.

Diphtheria.- In relation to recent years the diphtheria incidence continued low. The 4,013 cases reported for the current period were only about 80 percent of last year's figure and the lowest for this period in the 6 years for which data are available. In the West North Central, South Atlantic, and South Central sections the disease was less prevalent than at this time last year; a slight increase over last year was reported in the Mountain and Pacific areas. In other regions the incidence compared very favorably with that of last year.

Scarlet fever. The reported current incidence of scarlet fever, 20,866 cases, was about 15 percent in excess of that for the corresponding period in each of the years 1933 and 1932 and about 33 percent in excess of the figures for 1931 and 1930. The East North Central and Mountain and Pacific areas reported significant increases over last year's figures; the South Central regions, about a 30-percent decrease, and in other sections the incidence was approximately the same as that for last year.

Meningococcus meningitis. The seasonal rise of meningococcus meningitis, which in recent years has occurred during the preceding 4-week period, did not appear this year until the current period.

For the 4 weeks ended December 29 the number of reported cases was 202, as compared with 129 for the preceding 4-week period. The number was about 17 percent in excess of that for the corresponding period last year but was considerably below the number in preceding years.

While the total number exceeded that of last year, the cases were widely distributed over the various geographic areas and there was no indication of any unusual prevalence in any part of the country. States reporting apparently significant increases over last year were Colorado (6), Kansas (7), Alabama and Massachusetts (9 each), Texas (10), and Ohio (12). Although the numbers of cases were not high in those States, they were mostly responsible for an increase over last year in the areas in which they are located. The Middle Atlantic and Pacific States reported practically the same incidence as last year, and a decrease was reported in the South Atlantic section.

Poliomyelitis.—All sections of the country reported a decline of poliomyelitis during the current 4-week period, but for the country as a whole the incidence (185 cases) was considerably above the level of 1933 and also of 1932. For this period in 1931 and 1930 the numbers of cases were 266 and 332, respectively. In the Pacific area, where the disease has been prevalent in epidemic form, the number of cases (88) was 3.4 times that for the corresponding period last year; in the South Central and East North Central areas, into which the disease spread, the incidence was still high in comparison with recent years. Only 5 cases were reported from the Mountain section, which was also affected by the epidemic, and the West North Central and New England and Middle Atlantic regions reported the lowest incidence in recent years. In the South Atlantic States the number of cases (13) was below the average for preceding years.

Mortality, all causes.—The average mortality rate from all causes for the 4 weeks ended December 29, as reported by the Bureau of the Census, was 12.2 per 1,000 population (annual basis). For the corresponding period in the 4 preceding years the rates were 12.1, 13.4, 11.4, and 12.3, recessively. The rate for the week ended January 5, 1935, was 13.5, due no doubt to the apparently minor influenza epidemic that is present.

RAT AND RAT-FLEA SURVEY OF LOS ANGELES HARBOR

By H. E. Trimble, *Surgeon*, and G. C. Sherrard, *Acting Assistant Surgeon, United States Public Health Service*

The harbor district of Los Angeles lies 23 miles south of the city hall and comprises the towns of San Pedro, Wilmington, and Terminal Island. A survey was begun of this area on December 1, 1931, to determine the prevalence of rodents and the extent of their infesta-

tion by ectoparasites, especially fleas. The survey was conducted entirely by personnel of the quarantine station at San Pedro during spare time and in addition to their regular duties. An effort was made to trap live rats in a systematic manner, trapping each pier and building along, and immediately adjacent to, the water front, until that entire district had been trapped and retrapped. This was followed by trapping of the business, industrial, and residential districts. In addition, 25 ground squirrels (*Citellus beecheyi beecheyi*) were shot in the fields and hills adjacent to the residential district and examined for ectoparasites.

While conducting this survey, which covered a period of 19 months, rat traps of the wire-cage type were set for a total of 6,269 trap-days, each trap set being considered a trap-day for each day set until removed.

The docks at the port of Los Angeles, with few exceptions, are of fairly recent, reinforced-concrete construction and offer a surprisingly limited rat harborage. However, much of the harbor bank is faced with very large scatter-placed rocks, among which rats were often seen. During the period covered by this survey, the health department, city of Los Angeles, was waging a vigorous antirat campaign in the harbor district, poisoning, shooting, and trapping with snap traps, with as many as 50 men at a time so engaged in this limited area. Largely due to this activity, our catch of rats by cage traps was proportionately very small.

Two methods were used in recovering ectoparasites from rats. In the early part of the survey, rats were brought to the laboratory alive and their necks crushed with large forceps while still in the cage, and then they were immediately taken from the cage and suspended by the tail over a large shallow pan of water, and the ectoparasites were combed off and recovered from the water. This method was changed shortly after the survey began, and the live rats were allowed to enter, through a sliding door, a small box enameled white inside, and were killed by chloroform on a small piece of cotton inserted through a small, sliding glass window on top of the box. The rats were then removed and combed on a piece of white paper and the box was searched for any additional parasites that might have left their host during the anesthetizing process.

All ectoparasites were examined microscopically and classified by Dr. Sherrard after the usual preparation of clearing in a 10-percent potassium hydroxide solution, dehydrating slowly in alcohol and further clearing when necessary. Each rat or group of rats from each cage brought to the laboratory was given a serial number, and all data pertaining to both the rodent and the ectoparasites obtained were noted under a single serial number.

The accompanying tables and graphs show the number of rats and fleas obtained, by districts, and their relation to weather conditions. It was originally intended to show the rat-flea index by five zones, or districts; but on compiling data from the business, industrial, and residential districts, the results were so similar and the data so meager that it was thought advisable to combine all three into one. Those rats caught in the city dumps represent a harborage environment so different—being within the city, yet on large vacant plots of ground—that an additional district was created to show these data.

District	Rats	Fleas	Fleas per rat	Flea species per rat		
				C F	X C	L M
	Number	Number	Number			
Docks and immediate water front	238	537	2.25	0.34	1.130	0.73
Business, industrial, and residential	54	204	3.77	.18	.166	3.55
Open fields	26	168	6.46	.07	0	6.15
City trash dump	13	35	2.69	0	2.610	0

NOTE.—C F, *Ceratophyllus faciatus*. X C, *Xenopsylla cheopis*. L M, *Leptopsylla musculi*.

In addition to the species of fleas shown in the table, 20 *Echidnophaga gallinacea* and 1 *Ceratophyllus acutus* were obtained from rats, the number being too small for tabulation.

In compiling the meteorological data given in the accompanying graph, rainfall figures were obtained from the Marine Exchange of the Los Angeles Chamber of Commerce and are for the actual water front; all other data pertaining to meteorological conditions were obtained from the United States Weather Bureau at Los Angeles and were taken at a point approximately 10 miles from the nearest ocean point and 23 miles from the harbor. Data on ectoparasites and rats were averaged when covering the same month of different years so that the data from December to June, inclusive, cover a period of 2 years and are the mean average or total per month as the case may be, both as to number of ectoparasites and weather data.

Of the rats caught, all were *Rattus norvegicus* except for 8 *Rattus alexandrinus* and 2 *Rattus rattus*.

Of interest are the predominence of *Leptopsylla musculi* and the low index of all fleas. In the writer's opinion, the *Xenopsylla cheopis* index is too low to sustain an epidemic of rat plague; and it is very doubtful whether it would be sufficient to furnish a means of sustaining even an occasional plague infection of rodents. In comparing the index of *Xenopsylla cheopis* and *Leptopsylla musculi* for the various districts, it will be noted that the district which appears to be the most favorable to *Xenopsylla cheopis* is the least favorable to *Leptopsylla musculi* and vice versa. Probably surface moisture plays an important part in this, as the city trash dumps, where the highest *Xenopsylla cheopis* index and the lowest *Leptopsylla musculi* index

were found, is covered with rubbish, which would tend to hold surface moisture, thus affording a favorable hatching place for *Xenopsylla cheopis*. On the other hand, the open fields are unprotected from the sun and wind and become too arid during the 8 to 9 months of warm, dry weather experienced annually in this part of California to afford favorable conditions for *Xenopsylla cheopis* propagation.

In this part of California a species of small field mouse is very prevalent; and, as the *Leptopsylla musculi* index increases almost in direct ratio as the distance from the water front, it is possible that the association of rats with these mice accounts for the higher *Leptopsylla musculi* index on rats caught in open fields and the lower index on rats caught at the water front. It was noted that only one *Ceratophyllus acutus* was obtained from rats, although they were abundant

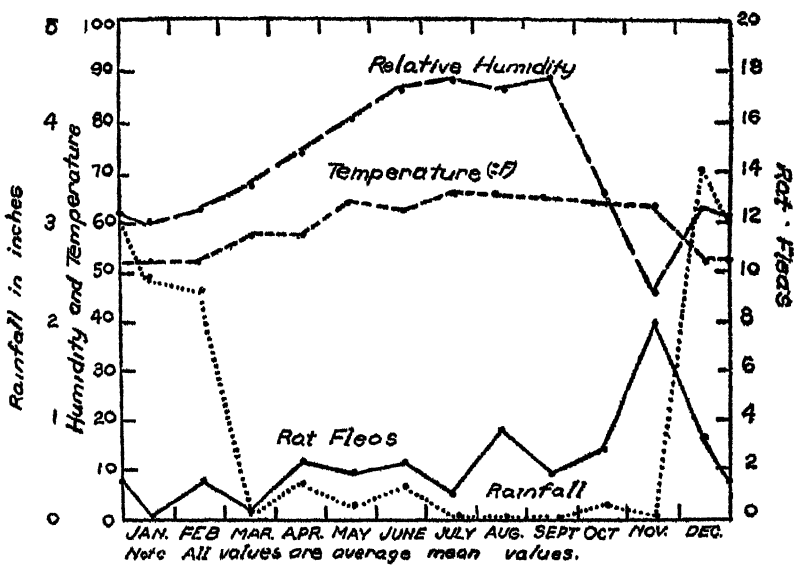

FIGURE 1.—Meteorological conditions and number of rat fleas found, by months.

on the ground squirrels in the hills immediately adjacent to the harbor.

In comparing the relation of the mean relative humidity, temperature, and rainfall with the rat-flea index, it will be seen that the flea index falls sharply in November with the fall in temperature and still more acutely with the increase in rainfall. The data regarding the prevalent flea, *Leptopsylla musculi*, would tend to confirm the tabulated figures, which show the highest *Leptopsylla musculi* index when the surface moisture is least. The drop in relative humidity to its lowest point of the year at the exact time that the flea index is highest is also indicative of this supposition. Due to fog, the humidity in this area is higher during the season that rainfall is least.

During the course of this survey an attempt was made to recover all the mites infesting each rodent examined and at least a portion of the lice. The results show a total of 201 lice of the *Polyplax spinulosa* species and 1,248 mites of the *Laelaps echidninus* species. No particular relation was noted between the degree of lice and mite infestation and weather conditions, both species of ectoparasites being fairly prevalent at all seasons and in all districts. While it had not been expected to recover any but *Polyplax spinulosa* of the lice species, it was somewhat surprising that only the single species of mites was recovered.

As plague infection among the ground squirrels of California has been reported at various places and times in the past, it was believed that data showing the flea infestation on squirrels would be interesting, and for this purpose 25 ground squirrels were shot in the hills immediately adjacent to the residential section of the port. Each squirrel was immediately placed in an empty white sugar sack after having been shot, and the open end of the sack was folded and securely tied, the bodies being brought to the laboratory and examined as for rats. The following tabulation shows the results obtained:

	Flea species			
	C A	H A	E G	Total
Number of squirrels examined				25
Number of fleas per squirrel	18 76	1 84	3 44	24 01
Number of fleas	469	46	86	601

NOTE.—C A, *Ceratophyllus acutus*, H A, *Hoplopsyllus anomalus*, E G, *Echidnophaga gallinacea*

These figures show a heavy infestation of ground squirrels with fleas, especially of the *Ceratophyllus acutus* species, which has been implicated as a carrier of ground-squirrel plague. While it is not generally believed that *Ceratophyllus acutus* is as effective in the transmission of plague between ground squirrels as is *Xenopsylla cheopis* between rats, it seems probable that an index of 18.76 *Ceratophyllus acutus* would be sufficient to maintain foci of plague infection. As all but one of the squirrels were shot during the month of May, no data are available as to the relation of flea infestation to weather conditions; but it was noted that the squirrels shot on the south slope of the hills showed a greater infestation than those shot on the north slope. This condition might not hold true for the warmer months of July, August, and September. The fact that none of the prevalent local rat fleas were obtained from any of the ground squirrels tends to show that either there is not a close association between the rats and squirrels in this locality or that the fleas are very selective in their natural hosts. The number of *Echidnophaga gallinacea* re-

covered may be accounted for by the fact that small chicken ranches are in fairly close proximity to the locality where the ground squirrels were obtained.

SUMMARY

1. The number of rodents examined was too small to justify any very definite conclusions.

2. A rat-flea survey was made of the harbor district of Los Angeles, which shows an average of 2.85 fleas per rat.

3. The most prevalent species found was the mouse flea, *Leptopsylla musculi*.

4. *Xenopsylla cheopis* was found to average slightly less than one flea per rat, and the heaviest infestation was found on rats caught along the water front and at the city trash dumps.

5. *Ceratophyllus acutus*, whose natural host is the California ground squirrel, was found only once on rats.

6. The prevailing rat species was *Rattus norvegicus*.

7. Wire-cage rat traps were set to the extent of 6,269 rat-trap days, resulting in a catch of 331 rats, or approximately 1 rat for each 19 days a trap was set.

8. California ground squirrels were heavily infested with fleas during the month of June, the prevailing species being *Ceratophyllus acutus*.

9. Lice of the *Polyplax spinulosa* species and mites of the *Laelaps echidninus* species were found to be fairly prevalent on rats at all seasons of the year and in all districts.

THE ADMINISTRATOR'S VIEWPOINT OF PSYCHIATRIC SERVICES IN A CORRECTIONAL INSTITUTION [1]

By JOSEPH W. SANFORD, *Superintendent United States Industrial Reformatory, Chillicothe, Ohio*

Very recently a well-known prison investigator criticized the tendency of many prison systems to focus its prison administration on a physical plan, suggesting that the principal objection is the prison architecture, prison gadgets, and routine. He expressed his disgust at being dragged through countless scientifically equipped laundries and kitchens with their well polished, gleaming boilers, through new mess halls and beautifully arranged operating rooms; and he was dismayed by the little interest displayed when it came to the human apparatus and procedure for reforming the complicated personalities of prisoners for whose care the institution was built.

[1] Presented at the Conference on Medical and Psychiatric Services of the Federal Penal and Correctional System, held at Springfield, Mo., September 13-15, 1934.

The program of the Bureau of Prisons has accepted this well-merited challenge. Perhaps it is no exaggeration to say that the concept of the scientific approach to the adult offender from every viewpoint has been brought to its highest point in the Federal Bureau of Prisons. While the Bureau recognizes the need for adequate housing and facilities in order successfully to fulfill the first function of penal administration, that of keeping the prisoner within the confines of the institution and housing and caring for him in common decency, it has also provided those facilities with adequate personnel which have for their main objective the rehabilitation and remolding of the prisoner in such a way that when he leaves the institution he will return to his home a better man and equipped in some measure again to take his place in society. I think it can be well stated that the policy of the Bureau is to imbue every warden, every guard, every professional employee, and every civilian with the idea that the primary function of the institution is to reeducate and rehabilitate the inmate, and to have every officer and civilian understand that he is an integral part of the educational and rehabilitation program.

Psychiatry in connection with the treatment of delinquency is not new. The introduction of this professional service in penal institutions is comparatively recent, and its development is not yet complete. As a matter of fact, we are using a service that has been available in juvenile courts and in the treatment of the criminal insane in the hospitals for many years. Psychiatric service will not function in an institution unless the administrator can see its value and use in the every-day routine of the institution and is willing to devote considerable time to this work, relinquishing other duties to those as well able to carry them on as he. In the Federal prison service, the medical and psychiatric service is not under the supervision of the Department of Justice, but under the United States Public Health Service. When it was first suggested that this arrangement be made, some prison officials expressed a fear of the consequences of bringing into the institutions a group of professional workers responsible neither to the warden nor to the Bureau of Prisons. That the two services have been able to function harmoniously and effectively speaks well for the understanding and capacity of the directing heads and for the willingness of the officers of both services to work toward a common goal. My experience in two institutions has not only dispelled all fears but has convinced me of the wisdom of the arrangement. Certainly the medical and psychiatric service in both institutions with which I have been associated has been of a high order and the cooperation and devotion to duty all that could be expected.

However, it must be stated here that there is still danger unless there is close cooperation and a wholesome mutual understanding

between the superintendent, the chief medical officer, and the psychiatrist. The staffs of both agencies will be quick to take advantage, with unfortunate results, if there is any lack of cooperation and understanding between the administrative officials. On the other hand, the staffs will be equally as quick to cooperate and effectively carry on the program where there is understanding, cooperation, and a wholesome respect for each other's responsibilities and authority. I would not care to be associated with a prison system which carries out only the first function of penal administration, that of protecting the public by the immolation of the inmate for the period of the judgment of the court. Most any hard-boiled jailor can achieve this objective, provided he is furnished with sufficient strong cells and guards. A true prison administrator is one who would never be satisfied with merely confining his charges. An institution should have a soul.

To say that an institution has a soul is to risk a cynical retort; but how can one better convey the idea? By this I mean that it is necessary to build up morale and spirit and inspire a tradition of honor and self-respect; so to administer and develop the program that every man entering the institution will achieve some real benefit and the institution will be considered as an establishment for the physical and mental regeneration of its inmates, rather than as a place for their punishment, where sound moral habits may be inculcated, and where industrial and agricultural instruction is furnished to those who need it, in order that the inmate may be restored to the community, when he completes his sentence, a useful citizen to it and to his family and not disposed to commit another offense. This soul or tradition that I speak of cannot be founded on buildings and equipment alone. It must be founded on a program of individualization and the personalities of the administrator and his associates who build morale, inspire self-respect, and redirect the energies of their charges along proper lines.

Obviously the administrator cannot possibly know intimately every one of his charges. The myriad of duties and responsibilities resting on the shoulders of the administrator of any one of the large Federal institutions is beyond the capacity of any one person to carry on alone. If he succeeds he must use to the full extent the resources furnished him by the Bureau of Prisons in analyzing and classifying the inmates and in providing correctional treatment for individual prisoners. Such services make possible case work procedure as a part of our progressive penal program in place of the mass treatment procedure of the older order of prison administration.

The physician, psychiatrist, psychologist, social worker, and educator provide through their special types of services a case analysis of individual prisoners which may not only be used for preventive and correctional procedure, but to contribute greatly to more efficient

administrative prison practices. These professional services provide the basis for the intelligent classification of the prison population and thereby enable the administrator to lessen one of the greatest detrimental influences of the old order of prison procedure; that is, the destructive influence of the worst elements or individuals over the remainder of the group. Discovery and segregation of such individuals are made easier through careful case analysis. Further, these professional services not only are analytical and preventive, but they aid the administrator who wishes to provide a constructive rehabilitation program.

In developing a program of rehabilitation we have found that this group of noncooperative individuals, totaling about 10 to 15 percent of the population, demand more time and attention than the larger group of inmates who have accepted their programs and are making an effort in some measure to cooperate with the administration and at the same time improve themselves. The psychiatric service is an integral and very necessary part of any program of individualized treatment. The understanding of the individual and the preparation of his program can be accomplished only by a thorough study of his case. This calls for professional service obtained in the examination and treatment of those who have not found it possible to conform to the normal trends of life. The psychiatrist and the psychologist must be practical in their diagnoses and treatment. Obviously, the average administrator neither has the professional knowledge nor the understanding of mental diseases, nor does he have the time to read lengthy and technical reports. For that reason the psychiatrist and psychologist should take a very active part in the everyday routine of the institution and should overlook no opportunity to contact the inmates. There should be absolute understanding and cooperation between the psychiatrist and psychologist on one hand, and the administrator and his associates on the other. This is highly essential. The chief source of contact with those who find themselves unable to conform to the institutional routine or those who do not desire to conform, is in the treatment of disciplinary infractions.

The administration of discipline has long been considered the prerogative of the executive officer. As the administrator is responsible for the development of morale and for the treatment of inmates coming into his charge, I consider the administration of discipline his chief responsibility. The morale and safety and reputation of the institution should not be left in the hands of a subordinate officer. The advice and counsel of the chief custodial officer will be found valuable, but there are so many important factors affecting the treatment administered following infractions of the regulations, that I believe the administration of discipline should not be left in the hands of any one individual.

In coming to prison administration after long experience in a juvenile court, where the treatment of cases involving juvenile delinquency was always planned with the advice and counsel of competent psychiatrists, I found that I was singularly handicapped in the handling of disciplinary matters without the presence of a psychiatrist to interpret on the spot the mental and emotional reactions of the inmate charged with infraction of rules. Out of this, in February 1934, grew the idea of a disciplinary board consisting of the superintendent, assistant superintendent, and the psychiatrist. In the absence of the psychiatrist, the psychologist acts as alternate. The functions and the operations of this board have been presented by others. Suffice it to say that the resultant improvement in the morale and in the behavior of those who have previously been problem cases is marked. A disciplinary board tends to minimize any personal feeling on the part of the inmate that may have been engendered in the handling of his case by one man, however just and careful he may have been. The inmate is more likely, I believe, to accept the action of a board of three experienced men as just and less arbitrary than the action of one man. At the same time we have observed a more wholesome attitude on the part of the custodial force toward disciplinary matters.

The disciplinary board is not only concerned with violations of institutional regulations, but interests itself with other matters which relate to individual conduct and problems. It may be stated here that the several functions of the disciplinary board have materially improved the morale and understanding between the inmate body and the staff and secured the social adjustment of many individual inmates. There is no doubt that the psychiatric department at Chillicothe is an integral and very important feature in the development of morale and in the carrying on of the program of individualized treatment. Psychiatric service has been most valuable in the assignment of inmates to quarters, and, I believe, in this connection, has contributed materially in lessening the number of attempted escapes from the institution. Other speakers have detailed the functions and practices of the psychiatric service at Chillicothe, and it is not necessary to repeat the many opportunities for the use of this professional service again. I feel it proper, however, to emphasize the importance, in our opinion, of the psychiatric service; for without this service it would not be possible to carry on a program of individualized treatment.

COURT DECISION ON PUBLIC HEALTH

Recovery allowed for illness resulting from failure to comply with occupational disease statute.—(United States Circuit Court of Appeals, Eighth Circuit; *Ford Motor Co.* v. *Brady*, 73 F.(2d) 248; decided October 12, 1934.) An action was brought by one who had been

employed by the defendant in a paint spraying room. Recovery was sought for tuberculosis which was alleged to have resulted from the failure of the defendant company to comply with the statutes of Missouri relating to occupational diseases. One section of the said statutes provided as follows:

SEC. 13252. *Employer to provide protection to employees from diseases.*—That every employer of labor in this State, engaged in carrying on any work, trade, or process which may produce any illness or disease peculiar to the work or process carried on, or which subjects the employee to the danger of illness or disease incident to such work, trade, or process, to which employees are exposed, shall, for the protection of all employees engaged in such work, trade, or process, adopt and provide approved and effective devices, means, or methods for the prevention of such industrial or occupational diseases as are incident to such work, trade, or process.

A jury returned a verdict in the plaintiff's favor and the circuit court of appeals, in taking the view that there was sufficient evidence to make a case for the jury under the above-quoted section, stated in part as follows:

Taking that view of the plaintiff's evidence which is most favorable to him, with all the inferences which may properly be drawn therefrom, we think that it does appear that the vapor, mist, or spray incident to the work, when breathed by those employed in the work, might (and did so far as plaintiff was concerned) produce illness or disease which was as peculiar to the work or process carried on as was the presence of the vaporized paint itself; that there were approved and effective devices which could have been provided for the protection of the plaintiff and the other employees engaged in such work, but that the defendant did not provide such effective devices except for a time, and thereafter substituted an ineffective device; and that it was the failure of the defendant in this regard which caused the plaintiff to have tuberculosis. There was therefore, we think, sufficient evidence to make a case for the jury under section 13252. The fact that no poisonous dusts were present, so that no duty to furnish respirators under section 13254 existed, would not relieve the defendant of its obligations under section 13252.

The judgment of the trial court was affirmed.

DEATHS DURING WEEK ENDED DEC. 29, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Dec. 29, 1934	Corresponding week, 1933
Data from 86 large cities of the United States:		
Total deaths	9,170	8,702
Deaths per 1,000 population, annual basis	12.8	12.2
Deaths under 1 year of age	580	619
Deaths under 1 year of age per 1,000 estimated live births	54	[1] 53
Deaths per 1,000 population, annual basis, 52 weeks of year	11.4	11.0
Data from industrial insurance companies:		
Policies in force	67,078,415	67,260,416
Number of death claims	11,184	12,690
Death claims per 1,000 policies in force, annual rate	8.7	9.8
Death claims per 1,000 policies, 52 weeks of year, annual rate	9.8	9.6

[1] Data for 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Jan. 5, 1935, and Jan. 6, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 5, 1935, and Jan. 6, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 5, 1935	Week ended Jan. 6, 1934	Week ended Jan. 5, 1935	Week ended Jan. 6, 1934	Week ended Jan. 5, 1935	Week ended Jan. 6, 1934	Week ended Jan. 5, 1935	Week ended Jan. 6, 1934
New England States:								
Maine	4		18	20	42	2	0	0
New Hampshire	2	5	1	2	24	103	0	0
Vermont	4					64	0	0
Massachusetts	11	13			195	945	1	1
Rhode Island	2	3	1		11	2	0	0
Connecticut	4	2	236	13	433	21	1	0
Middle Atlantic States:								
New York	36	59	[1] 47	[1] 26	671	573	5	3
New Jersey	23	20	338	22	39		1	2
Pennsylvania	76	70			1,334	501	4	1
East North Central States:								
Ohio	64	33	11	20	377	103	7	0
Indiana	30	36	183	56	353	166	0	2
Illinois	57	28	158	18	1,661	141	12	6
Michigan	4	13			45	7	0	1
Wisconsin	7	9	42	40	418	163	1	1
West North Central States:								
Minnesota	5	4	1	1	375	64	2	0
Iowa [3]	8	13	30	2	810	67	0	2
Missouri	62	60	192	11	161	321	0	1
North Dakota	6	5	310		152	45	1	0
South Dakota		2	1	1	19	157	0	0
Nebraska	9	11		11	94	33	0	0
Kansas	8	17	13	1	378	31	3	1
South Atlantic States:								
Delaware	5	4	6		7	5	0	1
Maryland [3]	0	11	420	31	26	16	0	1
District of Columbia	3	8	25	1	10	60	0	0
Virginia [3]	34	69			252	232	4	2
West Virginia	27	20	143	81	362	9	2	0
North Carolina	27	48	409	28	604	1,021	4	0
South Carolina	5	23	2,000	960	12	367	0	0
Georgia [4] [5]	11	13	481			897	0	2
Florida	3	4	30	1	19	1	0	0
East South Central States:								
Kentucky	36	43	209	8	438	10	1	0
Tennessee	12	26	251	84	11	325	2	3
Alabama [4]	23	20	510	76	155	195	2	0
Mississippi [3]	16	15					0	1

Footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 5, 1935, and Jan. 6, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 5, 1935	Week ended Jan. 6, 1934	Week ended Jan. 5, 1935	Week ended Jan. 6, 1934	Week ended Jan. 5, 1935	Week ended Jan. 6, 1934	Week ended Jan. 5, 1935	Week ended Jan. 6, 1934
West South Central States:								
Arkansas	12	16	37	10	2	159	1	1
Louisiana [4]	34	20	0	9	29	11	1	0
Oklahoma [6]	12	75	119	93	4	73	2	3
Texas [4]	76	147	423	288	88	270	1	2
Mountain States:								
Montana	5	1	14	17	88		6	0
Idaho		1	1		3	20	0	0
Wyoming					7	45	0	0
Colorado	5	13	0		396	8	1	0
New Mexico	4	5	11		19	59	1	0
Arizona		4	116	21	14	8	1	3
Utah [2]	1		2		10	558	0	1
Pacific States:								
Washington	2	1			44	284	0	0
Oregon	6	1	71	51	15	46	0	0
California	45	28	87	39	85	390	1	0
Total	843	1,043	6,965	2,051	10,322	8,578	68	42

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 5, 1935	Week ended Jan. 6, 1934	Week ended Jan. 5, 1935	Week ended Jan. 6, 1934	Week ended Jan. 5, 1935	Week ended Jan. 6, 1934	Week ended Jan. 5, 1935	Week ended Jan. 6, 1934
New England States:								
Maine	0	0	23	8	0	0	0	1
New Hampshire	0	0	3	7	0	0	0	1
Vermont	0	1	27	20	0	0	0	0
Massachusetts	3	0	146	168	0	0	3	1
Rhode Island	0	0	10	10	0	0	0	1
Connecticut	1	0	51	63	0	0	1	0
Middle Atlantic States:								
New York	1	2	444	528	0	0	13	6
New Jersey	2	2	100	144	0	0	2	5
Pennsylvania	2	0	643	509	0	0	35	11
East North Central States:								
Ohio	0	1	656	372	0	2	7	1
Indiana	0	0	175	168	4	5	2	0
Illinois	0	1	655	401	2	0	10	4
Michigan	0	0	98	150	0	0	3	2
Wisconsin	0	1	338	60	9	24	2	0
West North Central States:								
Minnesota	0	1	97	10	5	3	1	2
Iowa [2]	1	0	53	79	4	7	2	0
Missouri	0	0	91	134	0	12	12	3
North Dakota	1	0	20	27	5	0	0	1
South Dakota	0	0	45	35	3	1	0	0
Nebraska	1	0	49	30	6	2	3	0
Kansas	0	0	111	110	2	7	1	1
South Atlantic States:								
Delaware	0	0	37	7	0	0	0	0
Maryland [2]	0	0	105	81	0	0	6	4
District of Columbia	0	0	26	13	0	0	1	0
Virginia [6]	0	0	72	126	2	0	9	15
West Virginia	0	1	130	82	12	0	10	1
North Carolina	0	1	59	83	0	0	5	7
South Carolina	0	1	9	15	4	0	0	8
Georgia [4,5]	0	0	7	9	0	0	3	5
Florida	0	0	8	4	0	0	0	1
East South Central States:								
Kentucky	0	0	99	79	1	0	13	1
Tennessee	0	1	34	87	0	0	2	6
Alabama [4]	1	0	19	29	8	0	2	4
Mississippi [4]	0	0	13	25	0	1	3	8

Footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 5, 1935, and Jan. 6, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 5, 1935	Week ended Jan. 6, 1934	Week ended Jan. 5, 1935	Week ended Jan. 6, 1934	Week ended Jan. 5, 1935	Week ended Jan. 6, 1934	Week ended Jan. 5, 1935	Week ended Jan. 6, 1934
West South Central States:								
Arkansas	0	0	1	11	7	1	2	0
Louisiana [4]	2	2	41	10	2	0	11	7
Oklahoma [6]	0	0	125	30	0	3	6	3
Texas [4]	0	0	65	148	2	26	25	20
Mountain States:								
Montana	1	0	35	7	1	4	0	4
Idaho	0	0	1	13	0	0	1	1
Wyoming	0	0	13	5	10	0	0	0
Colorado	0	0	185	26	1	2	0	1
New Mexico	0	1	10	24	0	0	2	4
Arizona	0	0	17	13	0	0	1	0
Utah [2]	0	0	61	10	1	0	0	0
Pacific States:								
Washington	0	0	49	40	64	2	0	0
Oregon	0	0	51	51	2	8	1	2
California	13	2	193	198	18	10	8	18
Total	29	18	5,300	4,358	175	120	208	160

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Rocky Mountain spotted fever, week ended Jan. 5, 1935, 1 case in Virginia.
[4] Typhus fever, week ended Jan. 5, 1935, 15 cases, as follows: Georgia, 3; Alabama, 6; Louisiana, 1; Texas, 5.
[5] Dengue, week ended Jan. 5, 1935, 1 case in Georgia.
[6] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
October 1934										
Colorado	4	37	1		167		1	361	1	28
November 1934										
Alabama	1	226	234	732	244	14	3	152	2	30
Oklahoma [1]	4	71	124	66	15	3	0	99	10	93
December 1934										
Delaware		5	6		7		0	37	0	0
New Mexico	1	10	34	1	262	1	0	99	1	33
Tennessee	3	195	284	46	150	4	1	338	8	47
Vermont		10			14		0	77	0	2

[1] Exclusive of Oklahoma City and Tulsa.

October 1934	Cases
Colorado:	
Chicken pox	144
Impetigo contagiosa	22
Mumps	35
Septic sore throat	1
Vincent's infection	6
Whooping cough	68
November 1934	
Chicken pox:	
Alabama	81
Oklahoma [1]	44
Dengue:	
Alabama	202
Dysentery:	
Alabama (amoebic)	3
Oklahoma [1]	16
German measles:	
Alabama	3
Hookworm disease:	
Oklahoma [1]	1
Impetigo contagiosa:	
Oklahoma [1]	2
Lethargic encephalitis:	
Alabama	2
Mumps:	
Alabama	67
Oklahoma [1]	19
Ophthalmia neonatorum:	
Alabama	1
Oklahoma [1]	1
Rabies in animals:	
Alabama	72
Scabies	
Oklahoma [1]	2
Septic sore throat:	21
Oklahoma [1]	

November 1934—Con.	Cases
Tetanus:	
Alabama	5
Oklahoma [1]	3
Trachoma:	
Oklahoma [1]	4
Tularaemia:	
Oklahoma [1]	1
Typhus fever:	
Alabama	18
Undulant fever:	
Alabama	5
Vincent's infection:	
Oklahoma [1]	2
Whooping cough:	
Alabama	76
Oklahoma [1]	43
December 1934	
Anthrax:	
Delaware	1
Chicken pox:	
Delaware	50
New Mexico	55
Tennessee	294
Vermont	248
Dysentery:	
New Mexico	21
Tennessee	6
German measles:	
New Mexico	82
Tennessee	3
Impetigo contagiosa:	
Tennessee	4
Lethargic encephalitis:	
Delaware	1
Tennessee	3

December 1934—Con.	Cases
Mumps:	
Delaware	11
New Mexico	18
Tennessee	55
Vermont	7
Ophthalmia neonatorum:	
New Mexico	1
Tennessee	7
Paratyphoid fever:	
New Mexico	2
Puerperal septicemia:	
New Mexico	4
Rocky Mountain spotted fever:	
Tennessee	1
Scabies:	
Tennessee	28
Septic sore throat:	
Tennessee	5
Tetanus:	
Delaware	1
Trachoma:	
Tennessee	4
Tularaemia:	
Tennessee	4
Undulent fever:	
Delaware	2
Tennessee	1
Vermont	5
Vincent's infection:	
Tennessee	13
Whooping cough:	
Delaware	22
New Mexico	73
Tennessee	212
Vermont	167

[1] Exclusive of Oklahoma City and Tulsa.

WEEKLY REPORTS FROM CITIES

City reports for week ended Dec. 29, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	1	4	6	0	1	0	9	30
New Hampshire:											
Concord	------	------	2	------	0	------	------	1	------	------	9
Nashua	0	------	0	0	0	0	0	0	0	0	------
Vermont:											
Barre	0	------	------	0	------	0	0	------	0	0	4
Burlington	1	------	0	0	0	8	0	0	0	0	4
Massachusetts:											
Boston	6	------	2	4	20	37	0	9	1	37	220
Fall River	0	------	0	71	5	0	0	1	0	8	27
Springfield	1	------	0	7	0	4	0	0	0	1	43
Worcester	0	------	0	6	5	14	0	1	0	0	56
Rhode Island:											
Pawtucket	0	------	0	0	2	0	0	0	0	0	12
Providence	4	------	0	3	4	8	0	2	0	13	47
Connecticut:											
Bridgeport	1	2	0	2	5	7	0	1	0	0	43
Hartford	------	------	------	------	------	------	------	------	------	------	------
New Haven	0	2	0	12	2	2	0	1	0	0	32
New York:											
Buffalo	3	------	2	24	20	43	0	8	0	31	143
New York	27	76	21	33	210	184	0	86	4	199	1,680
Rochester	0	------	0	41	3	8	0	0	0	6	75
Syracuse	0	------	0	1	5	8	0	0	3	17	45
New Jersey:											
Camden	0	4	1	0	4	3	0	0	0	4	41
Newark	0	84	3	4	25	20	0	8	0	40	133
Trenton	1	11	1	10	0	14	0	2	0	0	30

City reports for week ended Dec. 29, 1934—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Pennsylvania:											
Philadelphia	4	24	11	6	66	65	0	14	0	78	554
Pittsburgh	2	6	4	35	21	32	0	5	3	27	148
Reading	1	---	1	0	0	7	0	0	0	14	21
Scranton	0	---	---	13	---	2	0	---	0	5	---
Ohio:											
Cincinnati	13	1	2	1	16	30	0	6	0	6	155
Cleveland	8	332	5	12	18	29	0	11	0	24	191
Columbus	5	---	0	17	5	38	0	2	0	0	78
Toledo	1	1	1	15	1	14	0	4	0	6	60
Indiana:											
Fort Wayne	2	---	0	1	3	1	0	1	0	0	26
Indianapolis	2	---	---	1	23	17	0	---	0	7	---
South Bend	0	---	0	35	1	1	0	0	0	0	21
Terre Haute	1	---	1	0	2	0	0	0	0	0	25
Illinois:											
Chicago	11	24	9	77	102	274	0	34	2	34	804
Springfield	0	---	0	1	5	10	0	0	0	2	26
Michigan:											
Detroit	9	24	2	43	33	82	0	16	1	26	258
Flint	4	---	0	6	2	12	0	0	0	1	30
Grand Rapids	0	---	0	1	1	11	0	2	1	11	35
Wisconsin:											
Kenosha	0	---	0	17	0	4	0	0	0	22	8
Madison	0	---	0	1	0	5	0	1	0	0	14
Milwaukee	0	---	0	66	8	151	0	4	0	52	114
Racine	0	---	0	0	1	1	0	0	0	1	14
Superior	0	---	0	25	1	0	0	0	0	0	6
Minnesota:											
Duluth	0	---	0	180	4	1	0	0	0	1	18
Minneapolis	2	---	0	77	12	22	1	1	0	1	111
St. Paul	---	---	---	---	---	---	---	---	---	---	---
Iowa:											
Davenport	0	---	---	19	---	0	0	---	0	0	---
Des Moines	1	---	---	0	---	8	0	---	0	0	35
Sioux City	0	---	0	8	0	1	0	0	0	1	0
Waterloo	3	---	---	101	---	0	0	---	0	0	---
Missouri:											
Kansas City	1	---	0	8	19	10	0	8	0	0	110
St. Joseph	3	---	0	2	8	0	0	1	0	1	30
St. Louis	12	4	0	2	14	15	0	6	0	3	241
North Dakota:											
Fargo	0	---	0	0	0	2	0	0	0	5	9
Grand Forks	0	---	---	1	---	5	0	---	0	0	---
South Dakota:											
Aberdeen	0	---	---	1	---	1	0	---	0	0	---
Nebraska:											
Omaha	5	---	0	10	9	12	1	0	0	1	62
Kansas:											
Topeka	---	---	---	---	---	---	---	---	---	---	---
Wichita	0	---	0	2	4	2	0	2	0	0	28
Delaware:											
Wilmington	1	---	0	0	9	1	0	1	0	3	36
Maryland:											
Baltimore	0	64	5	1	26	47	0	13	0	25	236
Cumberland	0	---	0	4	1	1	0	0	0	0	11
Frederick	1	---	0	0	0	0	0	0	0	0	1
District of Columbia:											
Washington	6	3	1	4	19	28	0	7	1	4	150
Virginia:											
Lynchburg	5	---	0	3	1	6	0	1	0	1	12
Norfolk	0	51	0	0	3	4	0	2	0	3	30
Richmond	2	---	1	33	8	2	0	4	1	0	61
Roanoke	2	---	0	3	0	6	0	0	0	0	17
West Virginia:											
Charleston	2	1	1	12	0	2	0	0	0	0	12
Huntington	1	---	---	1	---	2	0	---	0	0	---
Wheeling	0	---	0	4	2	10	0	0	0	18	10
North Carolina:											
Raleigh	0	---	0	0	2	1	0	1	0	1	20
Wilmington	0	---	0	0	1	0	0	0	0	0	9
Winston-Salem	1	4	2	0	2	2	0	0	0	15	17
South Carolina:											
Charleston	0	62	0	0	5	0	0	1	0	0	21
Columbia	0	---	1	0	4	0	0	0	0	0	19
Greenville	0	---	0	0	3	0	0	0	0	0	22
Georgia:											
Atlanta	2	172	9	0	12	3	0	4	0	2	119
Brunswick	0	---	0	0	1	3	0	0	0	0	8
Savannah	0	29	0	1	1	3	0	2	0	2	38

City reports for week ended Dec. 29, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Florida:											
Miami	2	--	2	0	1	1	0	2	0	0	42
Tampa	4	2	2	0	2	3	0	1	0	0	30
Kentucky:											
Lexington	1	---	0	1	3	1	0	2	1	1	22
Louisville	1	5	0	5	9	1	0	4	3	5	94
Tennessee:											
Memphis	2	--	4	0	11	6	0	7	2	3	96
Nashville	1	----	4	0	7	8	0	4	0	1	46
Alabama:											
Birmingham	4	20	0	1	6	2	0	2	0	0	62
Mobile	1	3	0	0	0	1	0	1	0	0	23
Montgomery	2	----	-------	0	-------	1	0	------	0	0	------
Arkansas:											
Fort Smith	0	------	-------	0	------	1	0	------	0	0	-------
Little Rock	0	-----	0	0	4	0	0	0	0	0	4
Louisiana:											
New Orleans	12	2	1	2	20	11	0	10	2	0	172
Shreveport	0	------	0	3	1	0	1	1	1	0	28
Oklahoma:											
Oklahoma City	0	------	0	0	5	2	0	0	0	0	44
Tulsa	1	------	-------	0	------	0	0	------	0	4	-------
Texas:											
Dallas	12	1	1	0	9	6	0	3	0	0	58
Fort Worth	2	-----	0	0	10	4	0	3	0	0	52
Galveston	0	-----	0	0	1	0	0	0	0	0	13
Houston	11	-----	1	0	7	3	0	1	0	0	75
San Antonio	1	------	2	1	10	1	0	13	0	0	76
Montana:											
Billings	5	------	0	4	0	2	0	0	0	0	7
Great Falls	2	------	0	0	1	0	0	0	0	0	7
Helena	0	------	0	19	0	0	0	0	0	0	2
Missoula	0	------	0	0	3	0	0	0	0	0	12
Idaho:											
Boise	0	------	0	0	2	0	0	0	0	0	4
Colorado:											
Denver	6	------	1	222	13	143	0	5	0	1	101
Pueblo	0	------	0	1	0	7	0	0	0	0	11
New Mexico:											
Albuquerque	0	------	0	1	2	2	0	2	0	0	18
Utah:											
Salt Lake City	0	------	0	9	4	42	0	1	0	10	33
Nevada:											
Reno	0	------	0	1	1	0	0	0	0	0	3
Washington:											
Seattle	0	------	-------	0	-----	2	5	------	0	0	-------
Spokane	0	4	3	14	5	0	0	0	0	0	35
Tacoma	0	------	0	9	0	0	0	0	0	0	33
Oregon:											
Portland	0	5	0	1	8	5	0	4	0	0	80
Salem	0	------	-------	0	------	0	0	---	0	2	------
California:											
Los Angeles	17	27	2	2	20	45	6	14	0	14	337
Sacramento	4	------	0	0	1	0	0	1	0	0	27
San Francisco	1	-----	0	2	18	15	0	6	0	0	175

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Missouri:			
Boston	0	1	0	St. Joseph	3	0	0
Fall River	0	1	0	District of Columbia:			
New York:				Washington	1	1	1
New York	2	2	0	Tennessee:			
Pennsylvania:				Memphis	1	0	0
Philadelphia	1	1	0	Alabama:			
Pittsburgh	0	0	1	Montgomery	1	0	0
Illinois:				Oklahoma:			
Chicago	8	2	0	Oklahoma City	1	0	0
Michigan:				Washington:			
Detroit	1	0	0	Spokane	1	0	0
Wisconsin:				California:			
Milwaukee	2	2	0	Los Angeles	0	0	3
Minnesota:				Sacramento	0	0	3
Minneapolis	0	0	1				

Lethargic encephalitis.—Cases: Chicago, 1; St. Joseph, 1; Memphis, 1.
Pellagra.—Cases: Baltimore, 1; Charleston, S. C., 1; Savannah, 1; New Orleans, 1; Sacramento, 1.

FOREIGN AND INSULAR

CANADA

Vital statistics—Second quarter 1934—Comparative.—The Bureau of Statistics of the Dominion of Canada has published the following preliminary statistics for the second quarter of 1934. The rates are computed on an annual basis. There were 20.6 live births per 1,000 population during the second quarter of 1934 and 22.1 per 1,000 population in the same quarter of 1933. The death rate was 9.4 per 1,000 population for the second quarter of 1934 and 9.7 for the second quarter of 1933. The infant mortality rate for the second quarter of 1934 was 70.6 per 1,000 live births and 69.4 in the same period of 1933. The maternal death rate was 5.5 per 1,000 live births for the second quarter of 1934 and 5.3 for the same quarter of 1933.

The accompanying tables give the numbers of births, deaths, and marriages for the second quarter of 1934, and deaths from certain causes by provinces for the second quarter of 1934, and the corresponding quarter of 1933:

Number of births, deaths, and marriages

Province	Live births	Deaths (exclusive of stillbirths)	Deaths under 1 year of age	Maternal deaths	Marriages
Canada [1]	55,680	25,378	3,934	305	19,437
Prince Edward Island	504	246	37	2	111
Nova Scotia	2,866	1,514	207	15	894
New Brunswick	2,569	1,135	195	11	688
Quebec	19,873	8,263	1,864	114	5,206
Ontario	15,069	8,571	807	95	7,702
Manitoba	3,200	1,201	171	10	1,290
Saskatchewan	4,870	1,525	204	24	1,094
Alberta	3,691	1,314	222	21	1,209
British Columbia	2,447	1,547	107	13	1,243

[1] Exclusive of Yukon and the Northwest Territories.

Deaths from certain causes in Canada for the second quarter of 1933 and 1934, and by Provinces for the second quarter of 1934

Cause of death	Canada[1] (second quarter)		Province, second quarter 1934								
	1933	1934	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Automobile accidents	193	220	2	14	4	62	91	7	5	16	19
Cancer	2,711	2,526	27	152	85	669	978	145	156	147	167
Diarrhea and enteritis	632	560	5	11	16	352	85	23	28	22	18
Diphtheria	48	42	-------	1	2	23	4	1	8	1	2
Diseases of arteries	1,727	1,823	17	102	62	342	946	107	72	74	101
Diseases of the heart	3,909	4,076	32	213	166	1,059	1,705	207	192	202	300
Homicide	45	27	-------	-------	-------	10	7	1	1	3	5
Influenza	617	522	7	41	22	197	128	31	51	29	16
Measles	58	54	-------	2	-------	30	2	8	5	-------	1
Nephritis	1,509	1,486	15	79	62	631	435	61	82	48	73
Pneumonia	1,614	1,709	21	140	94	652	551	78	113	70	80
Poliomyelitis	12	12	-------	1	1	4	1	3	2	-------	-------
Puerperal causes	312	305	2	15	11	114	95	10	24	21	13
Scarlet fever	28	56	1	-------	1	32	18	-------	2	2	-------
Smallpox	3	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Suicide	268	240	-------	6	3	35	103	15	29	25	24
Tuberculosis	1,966	1,914	29	144	80	828	358	125	91	93	166
Typhoid fever and paratyphoid fever	56	56	-------	1	4	32	9	4	6	-------	-------
Other violent deaths	1,167	978	5	61	36	261	331	62	59	63	100

[1] Exclusive of Yukon and the Northwest Territories.

CZECHOSLOVAKIA

Communicable diseases—October 1934.—During the month of October 1934, certain communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	3	-------	Paratyphoid fever	29	4
Cerebrospinal meningitis	9	2	Poliomyelitis	5	2
Chicken pox	192	-------	Puerperal fever	39	26
Diphtheria	4,863	271	Scarlet fever	4,051	33
Dysentery	819	128	Trachoma	141	-------
Influenza	29	1	Typhoid fever	928	51
Malaria	160	-------			

GREAT BRITAIN

England and Wales—Infectious diseases—Thirteen weeks ended September 29, 1934.—During the 13 weeks ended September 29, 1934, cases of certain infectious diseases were reported in England and Wales as follows:

Disease	Cases	Disease	Cases
Diphtheria	15,113	Puerperal pyrexia	1,325
Ophthalmia neonatorum	1,110	Scarlet fever	31,248
Pneumonia	6,303	Smallpox	2
Puerperal fever	570	Typhoid fever	407

England and Wales—Vital statistics—Third quarter, ended September 30, 1934.—During the quarter ended September 30, 1934, 149,311 live births and 97,469 deaths were registered in England and Wales. The following statistics are taken from the Quarterly Return of Births, Deaths, and Marriages, issued by the Registrar General of England and Wales. The figures are provisional.

Birth and death rates in England and Wales, quarter ended Sept. 30, 1934

Annual rates per 1,000 population:	
Live births	14.70
Stillbirths	.59
Deaths, all causes	9.60
Deaths from—	
Diphtheria	.08
Influenza	.04
Measles	.03
Scarlet fever	.02
Violence	.54
Whooping cough	.03

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Dec. 28, 1934, pp. 1585–1599. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Jan. 25, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Plague

Argentina—Santiago del Estero Province—Frias.—The report of one suspected case of plague at Lavalle, Argentina, as published on page 69 of the PUBLIC HEALTH REPORTS for January 11, 1935, has been officially reported as pneumonic plague at Frias, Santiago del Estero Province, Argentina.

Ecuador—Province of Loja—Amaluza.—A report dated January 8, 1935, states that a case of bubonic plague has occurred at Amaluza, Province of Loja, Ecuador.

Siam—Prachin—Nagara Nayok.—For the period December 17 to 29, 1934, four cases of plague have been reported at Nagara Nayok, Prachin, Siam.

Smallpox

Canary Islands—Santa Cruz de Tenerife.—During the week ended December 1, 1934, two cases of smallpox were reported at Santa Cruz de Tenerife, Canary Islands.

Mexico—Coahuila—Allende.—The report of 25 cases of smallpox at Allende, Coahuila, Mexico, as published on page 69 of the PUBLIC HEALTH REPORTS for January 11, 1935, has been supplemented by a later report dated December 28, 1934, which states there are about 48 cases of smallpox with 5 or 6 deaths at Allende, Coahuila, Mexico. Vaccination of all residents of the afflicted section of the town has been completed.

Yellow fever

Brazil—Matto Grosso State—Coronel Ponce.—During October 1934, one case of yellow fever was reported at Coronel Ponce, Matto Grosso State, Brazil.

Gambia—Bathurst.—For the period December 14 to 20, 1934, 1 case of yellow fever with 1 death was reported at Bathurst, Gambia.

Ivory Coast.—During the first 10 days of December 1934, 18 suspected cases of yellow fever, with 11 deaths, were reported in Nzi-Comoe Circle, Ivory Coast. Fifteen of these cases, with 10 deaths, were reported to have occurred in Toumodi, and 3 cases, with 1 death, in Dibro. This report includes the 4 suspected cases of yellow fever reported in Toumodi on December 10, 1934, published on page 35 of the PUBLIC HEALTH REPORTS for January 4, 1935. Toumodi is located about 150 kilometers from the coast, and about 50 kilometers from the railroad line at Dimbokro.

Nigeria—Kano.—On December 24, 1934, two cases of yellow fever were reported at Kano, Nigeria.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 50 JANUARY 25, 1935 NO. 4

SICKNESS AMONG MALE INDUSTRIAL EMPLOYEES DURING THE THIRD QUARTER AND THE FIRST 9 MONTHS OF 1934[1]

By Dean K. Brundage, *Statistician, Office of Industrial Hygiene and Sanitation, United States Public Health Service*

In the third quarter of 1934 the frequency of sickness and nonindustrial accidents causing disability for more than 1 week among approximately 170,000 male industrial employees was greater than in the third quarter of 1933, but less than the average frequency in the same quarter of the years 1929 to 1933, inclusive Considering the first 9 months as a whole, the incidence of illness was about 9 percent below the rate for the corresponding period of 1933 For the past 2 years the morbidity experience of employees of identical companies, 34 in number, is under comparison, while the rates for the third quarter of the years 1929 to 1933 include 20 of these 34 companies. The 20 companies employed 87 percent of the number of men on which the 5-year average sickness incidence rates are based; hence the rates appear to be fairly comparable for the different time periods shown in the table.

There will probably be a few delayed reports of cases having their onset in the recent quarter; but after allowing for some increase on this account, it seems reasonably safe to predict that the frequency of 8-day or longer cases for which sick-benefits are paid will be about the same this year as in 1933. This is somewhat remarkable in view of the fact that 1933 was a record year for low-sickness incidence in the sample of the industrial population under consideration. Previous to 1933 the record year was 1921, the year in which the collection of industrial morbidity statistics was instituted.

[1] The report for the second quarter and the first half of 1934 was published in the Public Health Reports for Oct 19, 1934, vol 49, no 42.

101957°—35——1

TABLE 1.—*Frequency of disability lasting 8 calendar days or longer in the third quarter and in the first 9 months of 1934, compared with the corresponding periods of 1933. (Male morbidity experience of industrial companies which reported their cases to the United States Public Health Service.)* [1]

Diseases and disease groups which caused disability. (Numbers in parentheses are disease title numbers from the International List of the Causes of Death, fourth revision, Paris, 1929.)	Annual number of disabilities per 1,000 men				
	Third quarter of			First 9 months of	
	1934	1933	5 years, 1929-33	1934	1933
Sickness and nonindustrial injuries [2]	71.1	66.3	78.3	76.7	84.1
Nonindustrial injuries	14.3	11.3	13.2	11.9	10.4
Sickness [2]	56.8	54.8	65.1	61.8	74.0
Respiratory diseases	15.3	14.0	17.9	23.1	29.5
Bronchitis, acute and chronic (106)	2.0	2.3	2.7	2.0	2.7
Diseases of the pharynx and tonsils (115a)	3.8	2.5	4.2	4.4	3.9
Influenza and grippe (11)	4.1	4.3	4.9	9.2	16.6
Pneumonia, all forms (107-109)	.9	.8	1.0	1.8	1.7
Tuberculosis of the respiratory system (23)	.7	1.0	1.1	.7	.9
Other respiratory diseases (104, 105, 110-114)	3.8	3.1	4.0	4.1	3.7
Nonrespiratory diseases	41.5	40.8	47.2	41.7	44.5
Diseases of the stomach, cancer excepted (117-118)	3.2	3.2	4.3	3.2	3.4
Diarrhea and enteritis (120)	1.5	1.3	1.8	1.2	1.1
Appendicitis (121)	4.4	3.6	3.8	4.0	3.3
Hernia (122a)	1.6	1.3	1.8	1.4	1.4
Other digestive diseases (115b, 116, 122b-129)	3.0	2.9	3.1	2.9	3.3
Rheumatic group, total	7.8	8.1	9.5	8.7	10.3
Rheumatism, acute and chronic (56, 57)	3.8	3.5	4.2	4.3	5.4
Diseases of the organs of locomotion (156b)	2.6	2.6	3.1	2.7	2.7
Neuralgia, neuritis, sciatica (87a)	1.4	2.0	2.2	1.7	2.2
Neurasthenia and the like (part of 87b)	1.0	.8	1.3	.8	.8
Other diseases of the nervous system (78-85, part of 87b)	1.1	1.4	1.3	1.3	1.5
Diseases of the heart and arteries, and nephritis (90-99, 102, 130-132)	3.0	2.7	3.3	3.1	3.8
Other genito-urinary diseases (133-138)	2.3	2.5	2.4	2.4	2.3
Diseases of the skin (151-153)	3.2	3.5	3.9	2.6	2.7
Epidemic and endemic diseases except influenza (1-10, 12-18, 33, 37, 38, part of 39 and 44)	1.9	1.4	1.3	2.7	2.2
Ill-defined and unknown causes (200)	1.5	2.8	2.5	1.7	2.2
All other diseases (19-22, 24-32, 36, part of 39 and 44, 40-43, 45-55, 58-77, 88, 89, 100, 101, 103, 154-156a, 157, 162)	6.0	5.3	6.9	5.7	6.2
Average number of males covered in the record	169,912	140,657	152,391	168,739	139,294
Number of companies included	34	34	23-34	34	34

[1] In 1933 and 1934 the same companies are included. The rates for the third quarter of the years 1929 to 1933 include 20 of these companies, which employed an average of 133,128 men during these months, or 87 percent of the 152,391 men representing the sample population for the 5-year average.
[2] Exclusive of disability from venereal diseases.

Unfortunately, not all of the important causes of illness exhibit the favorable trend depicted by the rates for all causes of illness combined. The frequency of nonindustrial accidents was greater in the third quarter of 1934 than in the same quarter of 1933, and above the 5-year average. During the first 9 months of 1934 the rate was about 15 percent greater than that recorded for the corresponding period of 1933.

Similarly, the frequency of appendicitis was greater in the third quarter of 1934 than in the corresponding period of 1933 or in the third quarter of the years 1929 to 1933. For the year as a whole the appendicitis incidence rate probably will considerably exceed its frequency in 1933.

An unfavorable rate will also be shown this year for the epidemic and endemic group of diseases (exclusive of influenza), but the increase

is not of broad significance, since it was due largely to a local outbreak of amoebic dysentery.

On account of their numerical importance the respiratory diseases are of special interest. There was a slight increase in the frequency of these diseases during the third quarter as compared with the same months of 1933, but the rate was below the 5-year average for the third quarter. During the first 9 months as a whole the frequency of respiratory diseases was definitely below the rate for the same period of 1933, due largely to a marked decrease in the incidence of influenza. The rate was 40 percent below the frequency of this disease in the first 9 months of 1933. Even more gratifying is the reduction in the number of new cases of respiratory tuberculosis per 1,000 men covered in the record. A diminished incidence was shown in the third quarter as compared with the same quarter of 1933. The latter rate was slightly below the average frequency of new cases of tuberculosis during the third quarter of the years 1929 to 1933, inclusive. During the first 9 months of 1934 the rate was lower than that recorded for the same period of 1933. For the full year 1934 the tuberculosis incidence rate will probably be less than half the rate shown for the year 1921 or for 1922. The trend in new cases of tuberculosis is paralleling the trend in the death rate from this disease, auguring continuation of the decrease in tuberculosis mortality which has been uninterrupted for years.

With the exception of influenza and pulmonary tuberculosis, no improvement is apparent in the respiratory morbidity picture. The frequency of pneumonia (all forms) was the same in the third quarter of 1934 as in the corresponding period of the preceding year For the 9 months as a whole pneumonia occurred at about the same frequency as in these months of 1933. Acute infections of the upper respiratory tract caused more 8-day or longer disabilities among the 163,000 men under consideration in the first 9 months of 1934 than in the same period of 1933. The frequency of "other respiratory diseases" was also greater in the January to October period of 1934 than in the same part of 1933.

Rather small, inconsequential differences are revealed in the occurrence of diseases of the stomach, diarrhea and enteritis, hernia, and "other digestive diseases." The rates for the rheumatic group of diseases indicate some improvement this year as compared with last year. Very little change occurred in the frequency of diseases of the nervous system, the genito-urinary diseases, and diseases of the skin. However, a lower frequency rate is indicated for one very important group, namely, diseases of the heart and arteries, and nephritis, the rate for which was 3.1 cases per year per 1,000 men during the first 9 months of 1934, as compared with 3.8 in the corresponding period of 1933.

As pointed out in previous communications, the sickness rates presented above apply to men employed either on a full-time or on a part-time basis, but not to men who have been unemployed for any appreciable period. The reporting companies employ men in all parts of the United States, but most of them are located in the North Central, North Atlantic, and New England States.

THE PLACE OF PSYCHIATRY IN A COORDINATED CORRECTIONAL PROGRAM[1]

By F. Lovell Bixby, Ph. D., *Assistant Director, Bureau of Prisons, Department of Justice*

The place of psychiatry in a coordinated correctional program has already been indicated in the several discussions which have pointed out its relationship to social service, discipline, the border-line mental cases, and general administration. I am going to take the liberty, therefore, of altering my subject slightly and talk to you about what might be called the "mechanics of coordination" under which psychiatry and the other special disciplines assume their proper place in a correctional institution.

The recent history of penology has as its distinguishing characteristic the appearance, on the roster of institutional officials, of psychiatrists, psychologists, social workers, and other specialists from fields dealing with the understanding and control of human conduct. Too often, however, we find that these specialists have been superimposed upon the existing prison organization without actually being assimilated in it. It is not uncommon to find the professional staff sitting lightly upon the institution organization like the foam upon a glass of beer, adding considerably to its appearance but quickly blown aside whenever there is serious work to be done.

The Bureau of Prisons has no intention of being content with lip service to the value of psychiatry and its allied fields. We believe that there is a great advantage to be gained in the way of more effective rehabilitation and in the way of more efficient administration from the practical application of psychiatric principles and methods. For that reason we are giving a great deal of thought and study to this question of the mechanics of coordination.

One of the major functions of a penal institution is to hold in safe custody the inmates committed to it until such time as it is proper to release them legally. For many years this was considered the sole purpose of a prison, and the traditional personnel organization was developed to fulfill this purpose. Within the last few years the more

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[1] Presented at the Conference on Medical and Psychiatric Services of the Federal Penal and Correctional System, held at Springfield, Mo., Sept. 13-15, 1934.

practical of those who have to do with penal affairs have realized that the safekeeping of prisoners is not enough, and that prisons are equally bound to exert every effort to rehabilitate and reform inmates. It is the recognition of this second obligation which has led to the introduction of psychiatric and other professional services into the penal field. Unfortunately, there has been a tendency to separate these two functions rather than to see them both as two aspects of the same basic problem, namely, the protection of society. In extreme cases this has led to establishing two separate personnel forces; one, frankly called custodial, and the other, rehabilitative or correctional. Even where the bifurcation is not thus officially recognized, there is a tacit division of the personnel which is none the less real because it is not official. Custodial and disciplinary officers often concern themselves little or not at all with the questions of rehabilitation. On the other hand, the professional staff is likely to ignore, or at least to take very lightly the custodial responsibility of the institution. This difference in point of view frequently results in mutual distrust and suspicion.

In the Federal service we have been fortunate in having splendid cooperation between custodial and professional personnel. Nevertheless, we must work constantly to make that cooperation even more effective and more complete.

Other papers have briefly sketched for you the modus operandi of the institution classification committee, which is the administrative device that the Bureau of Prisons adopted in 1932 as the best method of coordinating professional services in the solution of administrative problems. The Bureau is now making a special study of committee techniques and methods with a view to developing them to maximum efficiency, and I should like to have an opportunity to analyze the revised procedure with you in detail, but it is obviously impossible to do so under the present circumstances. I shall, however, ask you to bear with me a few minutes longer in order that I may try to point out four advantages of the committee technique as opposed to other proposed methods of coordination and four of the essential requirements for efficient committee work.

The first advantage comes from the fact that calling the professional and executive officers at the institution together under the chairmanship of the warden or superintendent, for the purpose of arriving at the solution of practical problems, permits an exchange of ideas and interaction of points of view which sooner or later reduces to negligible proportions any friction between the two groups of officers.

A second advantage of the classification committee is the education of its members in general penological administration. It is not enough that the prison doctor be a good physician, or the prison psychiatrist a good psychiatrist, or the prison educator a good educator. The entire professional staff must, of course, be competent in

the various specialties; but if they are to contribute the full measure of their service, they must also be well versed in all phases of prison administration. Through the regular meetings of the classification committee the chief executive officer builds up a group of professional consultants who are not only capable of counseling with him in specialized scientific matters, but who are also able to aid and assist him in determining matters of general policy.

The third advantage is the rather obvious one that group judgments under good leadership are less likely to be snap judgments and more likely to be sound than are the judgments of a single individual.

The fourth and final advantage which I shall mention lies in the fact that when the decisions as to inmates' programs are matters of committee action, it is difficult for an inmate to fix his resentment and fancied injustice on a single individual. This alone, in the opinion of many wardens, is of sufficient importance in institution discipline and morale to warrant the adoption of the committee plan. The judgments of a committee are more likely to be taken impersonally than those of a single individual, and even the psychopathic individual finds it difficult to believe that every member of the committee has a personal grudge to satisfy.

And now for a brief presentation of the four essential requirements. In order to be fully effective, the classification committee must operate under the chairmanship of the chief executive officer of the institution. In the last analysis the success or failure of the plan depends upon the leadership which he alone can give it.

The second requirement concerns the preparation of the case material. The committee meeting to which the various members bring long reports to read orally one after another wastes the time and energy of the members. Brief abstracts of the findings of the various examiners and interviewers and clear-cut recommendations must be carefully prepared in advance and brought together in a compact form which can be quickly read and easily comprehended at the time of the committee meeting.

Third, the committee must consider each case systematically. I have attended classification meetings at which the committee had no program but called the inmate in for a desultory conversation which, in many cases, did more harm than good. The committee meeting should never be used as an occasion for further examination of the inmate or for recapitulation of his past criminal career. The emphasis should be upon the proposed program and should look toward the future rather than toward the past. Likewise, every case should be considered under the same comprehensive headings to insure that cases are handled expeditiously but thoroughly.

Finally, the committee members must recognize that as members of the committee it is their first job to decide upon the best possible

program for each inmate and that they are not there to defend the recommendations they have made in advance of the meeting. In this connection, it is perhaps well to say that the deciding principle in each case should be neither the best interests of the prisoner as an individual nor the smooth running of the institution, but always the ultimate best interests of society.

YELLOW FEVER AND THE RECENT DECREE ON "VISCEROTOMY" IN COLOMBIA

In a discussion of the recent decree of the President of Colombia, making "viscerotomy" [1] compulsory in certain cases, Dr. George Bevier [2] states that the purpose of this service is to clear up the situation with regards to rumors of yellow fever outbreaks from time to time.

In 1923 there was an outbreak in Bucaramanga, and the diagnosis of yellow fever was not definitely established until sometime later by means of the protection test. In 1929 Socorro experienced a serious epidemic identified as yellow fever, and there was another at Guadalupe, Department of Santander, but the nature of the latter remained uncertain. In 1930 and 1931 sporadic cases of fever associated with jaundice were observed in the vicinity of Santa Marta, but were found not to be yellow fever.

In 1932 the results of protection tests in many persons from various parts of Santander, north of Santander and Boyaca, suggested that yellow fever was endemic in some of these areas, or that it had been present in recent years, while other areas appeared to have been free from the disease.

The attention of both the authorities and the public has been drawn several times toward Muzo, in view of suspicious outbreaks in that locality. In January 1934 there occurred several cases; in March there were five cases, four of which were fatal, and pathologic examination of one of them confirmed the diagnosis of yellow fever. The blood of a patient who had recovered gave a positive protection test. Another small outbreak occurred in June, and diagnosis was confirmed by several positive protection tests and two necropsies. There was a small epidemic in the town of Caparrapi in January and February 1933 and another one in June. At the beginning of 1934 several deaths occurred there, which were suggestive of yellow fever.

[1] Viscerotomy is the operation by which, without making autopsies, by means of the "viscerotome" the necessary quantity of liver for anatomo-pathological study is extracted, through a small hole from 1 to 2 cm in size made in the costal area of the hepatic region, without mutilating the body and with a minimum of time. On withdrawing the cannula of the instrument, the hole in the skin closes of itself, without it being necessary to take any stitches or apply adhesive plaster.

[2] Fiebre amarilla y el nuevo decreto sobre "viscerotomia"—El problema en Colombia. Revista de Higiene (Bogota), October 1934, pp. 369–373.

Judging from the above, the disease has been gradually spreading westward, and it is to be feared that it may reach Puerto Lievano, Guaduas, Utica, or Villeta, the populations of which are probably nonimmune. An epidemic with suspicious signs has developed in the vicinity of Restrepo (Meta), and four physicians from the National Department of Health are now studying it, and the town of Villavicencio has detailed several sanitary inspectors to control it.

Yellow fever is evidently still a problem in Colombia, and perhaps, a menace, and its true significance is neither known by public health officials nor fully understood by the public. The National Department of Health is now organizing a special unit to study the disease, which will function under the division of rural sanitation.

INTERNATIONAL CONVENTION FOR MUTUAL PROTECTION AGAINST DENGUE FEVER

An international convention of regional interest for the purpose of preventing the introduction and controlling the spread of dengue fever was drawn up at Athens on July 25, 1934, by representatives of the following-named countries: Albania, Bulgaria, Egypt, France, the German Reich, Great Britain, Greece, Italy, Rumania, Soviet Russia, Spain, Turkey, and Yugoslavia.

The convention provides for (1) the reciprocal notification of the appearance of dengue in epidemic form; (2) keeping the Office International d'Hygiene Publique informed of the progress of the epidemic; (3) appropriate action by vessels in infected ports or districts; (4) the protection from mosquitoes of patients on board vessels; (5) measures for vessels arriving from infected ports; and (6) measures applicable to passengers at borders (passengers to be held under observation for a period not exceeding 8 days from date of exposure, and the isolation of suspected cases of illness, protected from mosquitoes, for 5 days from the date of onset of illness).

The ratifications are to be deposited with the Greek Government. Other countries may adhere to the convention. The convention is to become effective 1 month after the Greek Government shall have received the ratifications or accessions of two Governments.

MORTALITY SUMMARY FOR LARGE CITIES, 1934

Number of deaths, death rates, and infant mortality for a group of 86 large cities in the United States for the 52-week period Dec. 31, 1933, to Dec. 29, 1934, and comparison with 1933

[From the Weekly Health Index, Bureau of the Census, Department of Commerce]

City	Total deaths [1]	Death rate [2] (per 1,000 estimated population)	Deaths under 1 year [1]	Provisional infant mortality rate, 1934 [2, 3]	Infant mortality rate, 1933	Actual mortality in calendar year 1933		
						Total deaths	Death rate [4] (per 1,000 estimated population)	Deaths under 1 year
Total 86 cities	423,989	11.4	30,552	54	55	411,348	11.0	30,586
Akron	2,164	8.1	171	42	47	1,984	7.4	171
Albany	1,900	14.4	130	54	47	1,863	14.1	109
Atlanta	4,391	15.2	445	88	83	3,948	13.6	419
White	2,314	12.1	251	80	64	2,026	10.6	203
Colored	2,077	21.2	194	101	113	1,922	19.6	216
Baltimore	11,096	13.4	874	65	61	10,796	13.0	824
White	8,391	12.5	599	58	53	8,245	12.2	546
Colored	2,705	17.7	275	88	87	2,551	16.6	278
Birmingham	3,352	11.8	352	76	71	3,112	10.9	320
White	1,643	9.3	158	59	56	1,550	8.8	143
Colored	1,709	15.8	194	98	88	1,562	14.4	177
Boston	11,255	14.3	864	55	50	11,085	14.0	959
Bridgeport	1,617	11.0	119	48	43	1,598	10.8	102
Buffalo	7,152	12.1	566	55	68	7,087	11.9	666
Cambridge	1,317	11.8	101	45	48	1,407	12.2	105
Camden	1,652	13.9	168	58	57	1,536	12.9	160
Canton	1,099	10.0	102	58	39	926	8.4	59
Chicago	36,190	10.1	2,291	48	49	34,798	9.7	2,271
Cincinnati	7,176	15.4	473	64	57	6,518	14.0	409
Cleveland	9,833	10.6	624	41	41	9,143	9.8	608
Columbus	4,359	14.4	211	52	69	4,017	13.2	322
Dallas	3,162	10.9	355	74	86	3,173	10.9	417
White	2,427	9.8	285	76	79	2,274	9.2	296
Colored	735	17.0	70	66	114	899	20.8	121
Dayton	2,638	12.6	147	44	51	2,456	11.7	157
Denver	4,080	13.7	208	59	55	3,971	13.3	255
Des Moines	1,575	10.7	121	42	45	1,657	11.2	121
Detroit	13,007	7.3	1,221	51	51	12,111	7.0	1,180
Duluth	1,105	10.8	64	38	47	1,061	10.4	77
El Paso	1,594	11.7	280	104	120	1,447	13.3	315
Erie	1,156	9.6	65	29	47	1,307	10.8	96
Evansville	1,335	12.4	93	61	65	1,151	10.7	92
Fall River [5]	1,452	12.6	84	40	63	1,569	13.6	124
Flint	1,402	8.0	104	57	59	1,320	7.5	184
Fort Wayne	1,291	10.4	75	41	34	1,166	9.4	60
Fort Worth	1,864	10.7	177	67	76	1,804	10.4	194
White	1,502	10.0	143	63	60	1,367	9.1	128
Colored	362	15.6	31	95	171	437	18.8	66
Grand Rapids	1,634	9.3	126	47	53	1,597	9.0	139
Hartford	2,108	12.3	211	62	56	2,059	12.0	204
Houston	3,700	10.9	377	75	61	3,532	10.4	309
White	2,576	9.7	266	73	45	2,248	8.4	164
Colored	1,124	15.6	111	81	105	1,284	17.8	145
Indianapolis	5,227	13.8	338	58	61	4,872	12.9	334
White	4,391	13.3	279	55	58	4,107	12.4	275
Colored	836	17.8	59	84	79	765	16.3	59
Jersey City	3,548	11.0	209	44	41	3,466	10.7	282
Kansas City, Kans	1,685	13.5	129	59	59	1,593	12.8	128
White	1,327	12.9	99	55	55	1,259	12.2	99
Colored	358	16.7	30	83	80	334	15.5	29
Kansas City, Mo	5,643	13.4	330	60	52	5,150	12.2	280
Knoxville	1,461	12.8	168	78	71	1,303	11.4	144
White	1,146	12.0	141	75	61	1,032	10.8	111
Colored	318	16.8	27	105	149	271	14.3	33
Long Beach	1,363	8.1	60	29	35	1,494	8.8	75
Los Angeles	14,957	10.3	913	53	57	14,772	10.2	911

See footnotes at end of table.

Number of deaths, death rates, and infant mortality for a group of 86 large cities in the United States for the 52-week period Dec. 31, 1933, to Dec. 29, 1934, and comparison with 1933—Continued

City	Total deaths	Death rate (per 1,000 estimated population)	Deaths under 1 year	Provisional infant mortality rate, 1934	Infant mortality rate, 1933	Actual mortality in calendar year 1933: Total deaths	Actual mortality in calendar year 1933: Death rate (per 1,000 estimated population)	Actual mortality in calendar year 1933: Deaths under 1 year
Louisville	3,982	12.9	149	27	66	4,184	13.5	330
White	3,041	11.7	128	27	60	3,202	12.3	257
Colored	941	19.7	21	28	98	982	20.5	73
Lowell [5]	1,330	13.3	105	62	61	1,337	13.3	106
Lynn	1,079	10.5	45	28	49	1,032	10.0	72
Memphis	4,562	17.1	497	111	111	4,356	16.2	166
White	2,311	14.0	244	91	93	2,155	13.0	237
Colored	2,251	22.0	253	140	140	2,201	21.5	229
Miami	1,513	13.7	95	62	58	1,240	11.2	98
White	1,104	12.9	57	52	45	859	10.0	55
Colored	409	16.9	38	88	94	381	15.7	43
Milwaukee	1,878	8.0	397	43	17	4,909	8.0	392
Minneapolis	5,035	10.3	321	44	49	5,059	10.3	350
Nashville	2,603	16.5	267	83	85	2,388	15.1	263
White	1,647	14.3	195	84	80	1,553	13.5	180
Colored	956	22.3	72	81	100	835	19.5	83
New Bedford [5]	1,249	11.1	110	63	56	1,333	11.8	94
New Haven	2,011	12.4	67	31	44	2,093	12.9	132
New Orleans	7,725	16.1	782	89	81	7,519	15.6	688
White	4,589	13.5	370	67	64	4,466	13.1	341
Colored	3,136	22.5	412	125	109	3,053	21.9	347
New York	75,416	10.3	5,261	52	53	75,322	10.3	5,478
Bronx Borough	11,217	7.8	704	44	41	11,053	7.7	707
Brooklyn Borough	25,439	9.3	1,947	48	50	25,862	9.5	2,079
Manhattan Borough	28,234	16.3	1,951	62	65	27,984	16.1	2,075
Queens Borough	8,215	6.5	536	49	44	8,053	6.3	482
Richmond Borough	2,311	13.5	123	50	53	2,370	13.8	13
Newark, N. J	4,731	10.5	325	43	43	4,921	10.9	34
Oakland	3,170	10.4	165	41	38	3,099	10.1	147
Oklahoma City	2,326	10.8	204	69	62	2,060	9.6	217
Omaha	2,917	13.4	175	42	47	2,631	11.9	187
Paterson	1,636	11.8	122	45	46	1,720	12.3	12
Peoria	1,337	11.8	108	38	49	1,165	10.2	7
Philadelphia	24,871	12.5	1,606	54	49	23,906	12.0	1,45
Pittsburgh	8,141	11.0	652	55	53	7,441	10.8	62
Portland, Oreg	3,651	11.6	140	34	38	3,521	11.2	144
Providence	3,047	11.8	239	48	55	3,156	12.2	27
Richmond	2,777	14.9	223	75	61	2,514	13.6	20
White	1,636	12.3	107	57	53	1,538	11.5	10
Colored	1,141	21.7	116	107	83	1,006	19.1	9
Rochester	3,558	10.6	204	41	51	3,781	11.2	25
St. Louis	11,703	14.0	720	58	15	10,548	12.6	54
St. Paul	3,100	11.0	175	38	46	2,807	10.2	20
Salt Lake City	1,724	11.7	160	51	50	1,528	10.4	15
San Antonio	3,273	12.9	571	101	113	3,477	13.7	56
San Diego	2,121	12.5	125	49	50	2,233	13.1	13
San Francisco	7,949	11.8	226	32	40	8,232	12.2	27
Schenectady	1,070	11.2	61	43	48	1,013	10.8	6
Seattle	4,181	11.8	175	34	38	4,170	10.9	17
Somerville	911	8.5	57	52	51	988	9.2	6
South Bend	868	7.6	51	34	41	840	7.3	6
Spokane	1,520	13.0	101	49	38	1,386	11.8	7
Springfield, Mass	1,731	11.1	119	50	52	1,719	11.0	12
Syracuse	2,495	11.4	174	48	40	2,411	11.0	14
Tacoma	1,455	13.3	80	41	34	1,418	13.0	6
Tampa	1,263	11.4	95	60	58	1,223	11.0	9
White	903	10.3	66	51	51	851	9.7	6
Colored	360	15.5	29	101	90	372	16.0	2
Toledo	3,699	12.2	224	51	59	3,456	11.3	23
Trenton	1,832	14.7	151	64	50	1,649	13.2	11
Utica	1,482	14.4	88	50	54	1,440	13.9	9

See footnotes at end of table.

Number of deaths, death rates, and infant mortality for a group of 86 large cities in the United States for the 52-week period Dec. 31, 1933, to Dec. 29, 1934, and comparison with 1933—Continued

City	Total deaths	Death rate [2] (per 1,000 estimated population)	Deaths under 1 year	Provisional infant mortality rate, 1934	Infant mortality rate, 1933	Actual mortality in calendar year 1933		
						Total deaths	Death rate [4] (per 1,000 estimated population)	Deaths under 1 year
Washington, D. C.	8,227	16.7	661	66	67	7,872	15.9	669
White	5,078	14.2	286	43	49	4,750	13.3	322
Colored	3,149	23.0	375	110	101	3,122	22.8	347
Waterbury	893	8.7	68	51	56	1,037	10.1	98
Wilmington, Del.[5]	1,722	16.2	109	50	55	1,570	14.7	115
Worcester	2,503	12.5	191	72	55	2,491	12.4	171
Yonkers	1,130	7.8	81	44	52	1,209	8.3	90
Youngstown	1,677	9.5	120	44	51	1,585	8.9	130

[1] Based upon telegraphic reports received each week from city health officers.
[2] Allowance has been made for the extra day which must be added to the 52 weeks to give a period of 365 days.
[3] Infant mortality rate is based upon deaths under 1 year as returned each week, and estimated live births, 1934.
[4] Based upon deaths which occurred within the calendar year.
[5] Mortality rates based upon population Apr. 1, 1930; decreased 1920 to 1930; no estimate made.

NOTE.—For the cities for which deaths are shown by color, the percentages of colored population in 1930 were as follows: Atlanta 33, Baltimore 18, Birmingham 38, Dallas 17, Fort Worth 16, Houston 27, Indianapolis 12, Kansas City, Kans., 19, Knoxville 16, Louisville 15, Memphis 38, Miami 23, Nashville 28, New Orleans 29, Richmond 29, Tampa 21, and Washington, D. C., 27.

DEATHS DURING WEEK ENDED JAN. 5, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Jan. 5, 1935	Corresponding week 1934
Data from 86 large cities of the United States:		
Total deaths	9,702	9,332
Deaths per 1,000 population, annual basis	13.5	13.0
Deaths under 1 year of age	605	630
Deaths under 1 year of age per 1,000 estimated live births	56	59
Data from industrial insurance companies:		
Policies in force	67,105,928	67,833,275
Number of death claims	10,739	10,178
Death claims per 1,000 policies in force, annual rate	8.3	7.8

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Jan. 12, 1935, and Jan. 13, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 12, 1935, and Jan. 13, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 12, 1935	Week ended Jan. 13, 1934	Week ended Jan. 12, 1935	Week ended Jan. 13, 1934	Week ended Jan. 12, 1935	Week ended Jan. 13, 1934	Week ended Jan. 12, 1935	Week ended Jan. 13, 1934
New England States:								
Maine	2	1	3	9	12	5	0	0
New Hampshire		1			24	85	0	0
Vermont		3			4	38	0	0
Massachusetts	12	20			287	1,209	0	2
Rhode Island	6	1	5		13	2	0	1
Connecticut	4	7	239	12	129	10	0	0
Middle Atlantic States:								
New York	64	54	[1] 52	[1] 16	1,110	652	2	5
New Jersey	27	27	323	26	66	110	0	1
Pennsylvania	73	84			1,799	916	3	4
East North Central States.								
Ohio	67	75	690	100	786	239	10	1
Indiana	52	41	137	75	499	170	1	1
Illinois	15	60	227	19	1,760	117	3	10
Michigan	12	14	52	7	252	46	2	0
Wisconsin	6	9	30	49	626	157	2	2
West North Central States:								
Minnesota	7	11		1	1,199	97	2	0
Iowa	14	13	50	15	1,483	63	1	0
Missouri	39	73	384	7	193	433	1	1
North Dakota	1		7	5	203	134	0	0
South Dakota	3	5		1	58	340	0	1
Nebraska	4	12			172	17	4	0
Kansas	18	20	21	1	468	29	0	2
South Atlantic States.								
Delaware		5	11	3		12	0	0
Maryland [2]	10	16	389	26	139	51	3	0
District of Columbia	6	13	22	5	9	101	0	0
Virginia	32	43			312	303	7	4
West Virginia	32	23	158	39	479	17	1	0
North Carolina [3]	30	51	401	49	689	1,382	3	0
South Carolina	5	15	1,832	684	7	334	0	0
Georgia [3 4]	10	12	1,944			849	1	0
Florida	9	14	14	3	31	11	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 12, 1935, and Jan. 13, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 12, 1935	Week ended Jan. 13, 1934	Week ended Jan. 12, 1935	Week ended Jan. 13, 1934	Week ended Jan. 12, 1935	Week ended Jan. 13, 1934	Week ended Jan. 12, 1935	Week ended Jan. 13, 1934
East South Central States								
Kentucky	38	20	316	7	650	7	4	2
Tennessee [3]	28	26	387	70	42	437	5	2
Alabama [3]	20	33	521	50	143	137	3	2
Mississippi [3]	15	14	-	-	-	-	0	0
West South Central States								
Arkansas	20	9	161	65	26	681	0	0
Louisiana	49	21	16	16	56	22	1	3
Oklahoma [3]	17	39	120	72	23	232	3	2
Texas [3]	77	232	338	1,262	51	1,135	3	4
Mountain States								
Montana	4	1	482	4	108	4	1	0
Idaho	-	-	4	3	11	24	0	0
Wyoming	-	-	-	-	12	41	0	0
Colorado	12	5	-	-	624	11	1	0
New Mexico	11	8	9	3	41	124	1	0
Arizona	1	2	67	21	8	16	0	4
Utah [3]	-	1	-	-	6	606	0	0
Pacific States								
Washington	5	3	3	-	58	400	0	0
Oregon	1	2	96	31	40	27	0	0
California	49	48	142	48	144	635	2	3
Total	937	1,187	10,023	2,801	14,952	12,529	70	57

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 12, 1935	Week ended Jan. 13, 1934	Week ended Jan. 12, 1935	Week ended Jan. 13, 1934	Week ended Jan. 12, 1935	Week ended Jan. 13, 1934	Week ended Jan. 12, 1935	Week ended Jan. 13, 1934
New England States:								
Maine	0	2	22	19	0	0	1	1
New Hampshire	0	0	6	35	0	0	0	0
Vermont	0	0	27	12	0	0	0	0
Massachusetts	0	1	109	200	0	0	0	3
Rhode Island	0	0	14	23	0	0	0	0
Connecticut	0	0	61	62	0	0	3	0
Middle Atlantic States:								
New York	2	2	627	687	0	0	9	7
New Jersey	0	0	128	165	0	0	4	5
Pennsylvania	1	0	660	709	0	0	3	13
East North Central States:								
Ohio	3	0	805	551	2	0	4	2
Indiana	0	0	-	188	5	2	2	0
Illinois	0	0	718	528	0	3	5	7
Michigan	0	2	301	335	1	1	8	1
Wisconsin	0	0	555	137	21	18	0	0
West North Central States:								
Minnesota	0	1	147	66	3	1	0	1
Iowa	0	0	88	72	2	2	1	0
Missouri	0	1	81	147	5	2	7	3
North Dakota	0	0	78	10	0	1	0	2
South Dakota	0	0	18	18	14	1	1	2
Nebraska	0	0	67	39	39	2	0	0
Kansas	0	0	131	121	1	4	2	3
South Atlantic States:								
Delaware	0	1	13	12	0	0	1	1
Maryland [4]	0	0	100	110	0	0	4	5
District of Columbia	0	0	27	16	0	0	0	1
Virginia	0	0	72	123	0	0	5	5
West Virginia	1	1	136	67	1	0	7	5
North Carolina [4]	0	0	69	115	0	0	7	2
South Carolina	0	3	9	0	0	0	1	6
Georgia [3,4]	0	0	20	14	0	0	4	7
Florida	1	0	16	8	0	0	0	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 12, 1935, and Jan. 13, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 12, 1935	Week ended Jan. 13, 1934	Week ended Jan. 12, 1935	Week ended Jan. 13, 1934	Week ended Jan. 12, 1935	Week ended Jan. 13, 1934	Week ended Jan. 12, 1935	Week ended Jan. 13, 1934
East South Central States:								
Kentucky	0	0	92	66	0	1	12	2
Tennessee [3]	0	0	61	72	1	0	4	9
Alabama [3]	0	1	24	21	0	1	1	3
Mississippi [2]	0	1	24	13	1	0	1	0
West South Central States:								
Arkansas	0	0	11	13	4	2	7	5
Louisiana	1	0	18	28	1	5	12	9
Oklahoma [5]	1	0	60	21	1	0	7	2
Texas [3]	3	0	53	240	4	6	46	21
Mountain States:								
Montana	1	0	23	16	0	0	1	0
Idaho	0	0	3	6	0	0	1	2
Wyoming	0	0	6	18	8	2	0	1
Colorado	0	0	260	14	4	3	0	0
New Mexico	0	0	23	31	0	0	3	4
Arizona	0	2	23	22	0	0	0	0
Utah [2]	0	0	26	10	0	1	0	0
Pacific States:								
Washington	3	5	48	36	109	8	1	0
Oregon	1	0	95	60	3	8	0	0
California	13	8	217	343	10	6	4	11
Total	31	31	6,364	5,709	240	80	179	153

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Jan. 12, 1935, 12 cases, as follows: North Carolina, 3; Georgia, 2; Tennessee, 2; Alabama, 2; Texas, 3.
[4] Dengue, week ended Jan. 12, 1935, Georgia, 26 cases.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
October 1934										
New Hampshire		1					0	33	0	2
November 1934										
Colorado		42			577		2	717	16	10
Mississippi	3	118	2,355	4,191	111	205	2	180	0	28
New Hampshire		1					1	51	0	2
Puerto Rico		58	107	1,763	54		0		0	15
December 1934										
California	13	210	175	12	558	5	72	916	32	33
Connecticut	2	8	98		1,269		0	171	0	3
District of Columbia	1	39	22		15		1	117	0	1
Florida	1	54	4	54	23	45	2	37	1	13
Georgia	4	74	1,652	127	52	13	1	53	1	30
Indiana	2	207	189		975		10	957	9	19
Maine	3	9	11		97		3	127	0	27
Massachusetts	10	69		2	650		1	648	0	11
New Hampshire		3	1				0	72	0	2
New Jersey	3	127	969	2	191		3	522	0	11
North Carolina	11	190	307		1,944	7	3	351	0	27

November 1934

	Cases
Anthrax:	
Puerto Rico	1
Chicken pox:	
Colorado	375
Mississippi	169
Puerto Rico	18
Dengue:	
Mississippi	21
Dysentery:	
Colorado	1
Mississippi (amoebic)	90
Puerto Rico	58
Hookworm disease:	
Mississippi	186
Impetigo contagiosa:	
Colorado	12
Mumps:	
Colorado	33
Mississippi	169
Puerto Rico	20
Ophthalmia neonatorum:	
Puerto Rico	7
Paratyphoid fever:	
Colorado	2
Puerperal septicemia:	
Mississippi	18
Puerto Rico	5
Rabies in animals:	
Mississippi	2
Tetanus:	
Puerto Rico	6
Tetanus, infantile:	
Puerto Rico	7
Trachoma:	
Mississippi	1
Puerto Rico	2
Tularaemia:	
Colorado	1
Vincent's infection:	
Colorado	1
Whooping cough:	
Colorado	83
Mississippi	627
Puerto Rico	165
Yaws:	
Puerto Rico	1

December 1934

	Cases
Botulism:	
California	1
Chicken pox:	
California	1,285
Connecticut	817
District of Columbia	241
Florida	65
Georgia	116
Indiana	663
Maine	351
Massachusetts	1,781
New Jersey	1,181
North Carolina	614
Conjunctivitis:	
Georgia	4
Maine	1
Dengue:	
Florida	7
Georgia	195
Dysentery:	
California (amoebic)	10
California (bacillary)	7
Connecticut (bacillary)	3
Florida (bacillary)	1
Georgia (amoebic)	6
Georgia (bacillary)	8
Massachusetts (amoebic)	1
Massachusetts (bacillary)	1
Food poisoning:	
California	5
German measles:	
California	77
Connecticut	28
Maine	97
Massachusetts	328
New Jersey	48
North Carolina	4
Granuloma, coccidioidal:	
California	4
Hookworm disease:	
California	1
Georgia	1,049
Lead poisoning:	
Massachusetts	1
New Jersey	1
Leprosy:	
California	2
Lethargic encephalitis:	
Connecticut	1
Indiana	2
Massachusetts	4
New Jersey	5
Mumps:	
California	435
Connecticut	132
Florida	32
Georgia	40
Indiana	12
Maine	35
Massachusetts	212
New Jersey	256
Ophthalmia neonatorum:	
California	3
Connecticut	1
Massachusetts	89
New Jersey	2
Paratyphoid fever:	
California	4
North Carolina	2

December 1934

	Cases
Rabies in animals:	
California	64
Connecticut	1
Indiana	42
Massachusetts	30
New Jersey	16
Rabies in man:	
Georgia	1
Rocky Mountain spotted fever:	
North Carolina	1
Septic sore throat:	
California	10
Connecticut	15
Georgia	50
Indiana	4
Maine	5
Massachusetts	5
North Carolina	2
Tetanus:	
California	4
Connecticut	1
Massachusetts	3
New Jersey	1
Trachoma:	
California	10
Massachusetts	2
Trichinosis:	
California	3
Connecticut	6
Massachusetts	13
New Jersey	4
Tularaemia:	
Indiana	1
North Carolina	2
Typhus fever:	
Florida	1
Georgia	28
North Carolina	5
Undulant fever:	
California	16
Connecticut	7
District of Columbia	1
Georgia	5
Indiana	1
Maine	1
New Jersey	2
North Carolina	2
Vincent's infection:	
Maine	2
Whooping cough:	
California	273
Connecticut	280
District of Columbia	22
Florida	22
Georgia	59
Indiana	107
Maine	271
Massachusetts	651
New Jersey	1,088
North Carolina	872

WEEKLY REPORTS FROM CITIES

City reports for week ended Jan. 5, 1935

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Maine:											
Portland	0		0	1	3	5	0	0	0	9	18
New Hampshire:											
Concord	0		0	0	1	0	0	0	0	0	11
Nashua	2			0		1	0		0	5	
Vermont:											
Barre											
Burlington	0		0	0	0	12	0	0	0	0	7
Massachusetts:											
Boston	4		1	6	30	39	0	7	0	22	237
Fall River	1		1	128	3	1	0	3	0	12	32
Springfield	0		0	15	5	5	0	2	0	3	15
Worcester	0		1	2	11	6	0	1	0	5	71
Rhode Island:											
Pawtucket	0		0	0	0	2	0	0	0	0	11
Providence	1	1	1	2	8	3	0	3	0	2	67
Connecticut:											
Bridgeport	0	6	0	0	3	7	0	0	0	4	32
Hartford	0		0	80	1	7	0	0	0	6	35
New Haven	3	4	1	13	5	2	0	1	0	1	32
New York:											
Buffalo	0		3	17	35	52	0	3	0	14	152
New York	34	47	19	66	227	176	0	91	6	227	1,730
Rochester	0	2	0	94	5	14	0	2	0	22	75
Syracuse	0		0	1	5	3	0	0	0	7	37
New Jersey:											
Camden	0	8	4	1	1	4	0	1	0	4	34
Newark	0	60	5	0	12	9	0	12	0	57	129
Trenton	2	14	4	4	8	12	0	4	0	1	50
Pennsylvania:											
Philadelphia	10	25	11	2	59	70	0	20	0	119	544
Pittsburgh	12	19	9	50	24	37	0	7	1	25	194
Reading	0		2	2	5	2	0	1	0	4	37
Scranton	0			9		4	0		0	3	
Ohio:											
Cincinnati	20		2	2	26	25	0	12	0	2	201
Cleveland	7	451	8	37	44	35	0	11	1	26	235
Columbus	11		0	36	6	73	0	1	0	1	90
Toledo	1	1	0	57	4	20	0	1	0	7	80
Indiana:											
Fort Wayne	5		0	0	2	3	0	2	0	0	21
Indianapolis	4		2	1	42	27	1	0	0	13	
South Bend	0	1	1	60	7	1	0	0	0	4	28
Terre Haute	0			0		0	0		0	0	
Illinois:											
Chicago	13	38	18	99	105	253	0	47	0	39	851
Springfield	0		0	3	5	5	0	1	0	8	26
Michigan:											
Detroit	8	52	8	61	51	69	0	12	1	47	310
Flint	3		0	8	5	11	0	0	1	2	21
Grand Rapids	0		1	17	2	8	0	1	0	1	33
Wisconsin:											
Kenosha	0		0	11	0	6	0	0	0	11	5
Madison	0		1	9	0	4	0	0	0	3	9
Milwaukee	1	4	2	96	12	200	0	3	0	50	112
Racine	0		0	1	2	5	0	0	0	2	12
Superior	0		1	7	1	0	0	0	0	0	10
Minnesota:											
Duluth	0		0	241	3	2	0	0	0	0	19
Minneapolis	3		1	42	6	29	0	2	1	2	116
St. Paul	0		0	17	18	10	0	1	0	15	67
Iowa:											
Davenport	0			42		1	0		0	0	
Des Moines	0	1		9		3	0		0	0	38
Sioux City	1		0	8	0	0	0	0	0	2	
Waterloo	4			217		2	0		0	0	

City reports for week ended Jan. 5, 1935—Continued

State and city	Diphtheria cases	Influenza: Cases	Influenza: Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Missouri:											
Kansas City	0	1	1	3	22	11	0	4	0	3	127
St. Joseph	---	---	---	---	---	---	---	---	---	---	---
St. Louis	12	5	2	4	20	14	0	7	1	6	234
North Dakota:											
Fargo	0	---	1	0	2	1	0	0	0	2	9
Grand Forks	0	---	---	0	---	1	0	---	0	2	---
South Dakota:											
Aberdeen	0	---	---	15	---	0	0	---	0	2	---
Nebraska:											
Omaha	4	---	0	5	8	15	1	1	0	0	61
Kansas:											
Topeka	0	---	0	3	2	0	0	0	0	2	21
Wichita	2	---	1	11	8	5	0	1	0	0	35
Delaware:											
Wilmington	---	---	---	---	---	---	---	---	---	---	---
Maryland:											
Baltimore	3	176	5	1	45	48	0	7	1	22	231
Cumberland	0	3	2	2	2	1	0	0	0	2	10
Frederick	1	---	0	0	0	1	0	0	0	0	4
District of Columbia:											
Washington	3	25	4	10	33	26	0	14	1	9	215
Virginia:											
Lynchburg	0		0	14	2	6	0	0	0	1	15
Norfolk	0	715	0	1	7	3	0	0	0	5	39
Richmond	2	---	4	27	7	4	0	3	0	1	65
Roanoke	1	---	0	4	1	9	0	0	0	0	24
West Virginia:											
Charleston	2	1	0	29	5	2	0	1	0	3	22
Huntington	2	---	---	2	---	6	0	---	0	0	---
Wheeling	1	---	0	1	5	20	0	2	0	11	27
North Carolina:											
Raleigh	---	---	---	---	---	---	---	---	---	---	---
Wilmington	0	---	0	0	0	0	0	1	0	0	4
Winston-Salem	1	3	0	0	1	4	0	3	0	39	14
South Carolina:											
Charleston	0	150	1	0	5	3	0	3	0	0	26
Columbia	0	---	0	0	4	0	0	0	0	0	15
Greenville	0	---	0	0	3	0	0	0	0	3	18
Georgia:											
Atlanta	0	215	12	0	21	5	0	6	0	4	129
Brunswick	0	---	0	0	1	0	0	0	0	0	7
Savannah	0	125	6	0	3	0	0	1	0	2	33
Florida:											
Miami	0	3	0	1	3	0	0	1	0	0	37
Tampa	1	---	0	0	0	1	0	0	0	0	24
Kentucky:											
Ashland	0	3	0	0	0	0	0	0	1	3	0
Lexington	0	7	0	3	7	3	0	1	0	1	23
Louisville	1	66	1	16	22	11	0	1	1	12	119
Tennessee:											
Memphis	2	---	7	0	24	5	0	9	0	3	125
Nashville	4	---	1	1	9	4	0	6	0	5	82
Alabama:											
Birmingham	3	35	3	3	10	1	0	2	0	0	65
Mobile	2	1	0	0	2	0	0	0	0	0	15
Montgomery	2	2	---	2	---	0	0	---	0	0	---
Arkansas:											
Fort Smith	---	---	---	---	---	---	---	---	---	---	---
Little Rock	0	---	1	0	6	0	0	2	0	0	9
Louisiana:											
New Orleans	23	4	1	6	19	10	0	15	5	0	164
Shreveport	1	---	0	7	7	5	0	4	0	0	50
Oklahoma:											
Oklahoma City	0	19	2	0	10	2	0	1	1	0	32
Tulsa	0	---	---	1	---	6	0	---	1	3	---
Texas:											
Dallas	11	---	0	0	10	4	0	1	1	0	72
Fort Worth	4	---	1	0	6	8	0	1	0	0	39
Galveston	1	---	0	0	4	1	0	1	0	0	19
Houston	5	---	0	0	11	0	0	2	0	0	69
San Antonio	2	---	5	3	11	0	0	3	0	0	60

City reports for week ended Jan. 5, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Montana:											
Billings	1	------	0	12	0	1	0	0	0	0	2
Great Falls	0	------	0	82	3	1	0	2	0	0	9
Helena	0	------	0	27	0	0	0	0	0	0	5
Missoula	0	------	0	0	0	0	0	0	0	0	2
Idaho:											
Boise	0	------	0	0	1	0	0	0	0	0	7
Colorado:											
Denver	3	49	1	301	15	127	1	4	0	3	99
Pueblo	0	------	0	2	1	8	0	0	0	0	12
New Mexico:											
Albuquerque	0	------	1	1	2	1	0	8	0	0	18
Utah:											
Salt Lake City	0	------	1	3	7	41	1	1	0	33	35
Nevada:											
Reno	0	------	0	0	0	1	0	0	0	0	3
Washington:											
Seattle	0	------	1	0	6	5	1	1	0	0	83
Spokane	0	2	2	36	5	4	0	1	0	0	38
Tacoma	0	------	0	4	0	1	11	0	0	0	33
Oregon:											
Portland	1	1	1	2	13	11	0	2	0	0	105
Salem	0	------	------	0	------	1	0	------	0	0	------
California:											
Los Angeles	23	57	0	5	17	47	16	19	0	12	305
Sacramento	1	2	0	0	7	5	0	6	0	3	42
San Francisco	2	3	0	4	29	12	0	11	0	9	190

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Connecticut:				Wisconsin:			
New Haven	1	0	0	Milwaukee	1	0	0
New York:				Minnesota:			
New York	4	3	1	St. Paul	1	0	0
Rochester	0	1	0	Missouri:			
Pennsylvania:				Kansas City	2	0	0
Philadelphia	0	1	0	Georgia:			
Ohio:				Atlanta	1	0	0
Cincinnati	6	0	0	Tennessee:			
Cleveland	1	0	0	Memphis	1	1	0
Toledo	1	0	0	Oklahoma:			
Illinois:				Oklahoma City	0	1	0
Chicago	9	8	0	Colorado:			
Michigan:				Denver	1	1	0
Detroit	1	1	0	New Mexico:			
				Albuquerque	1	1	0

Dengue.—Cases: Savannah, 25.
Lethargic encephalitis.—Cases: New York, 1; Chicago, 1; St. Paul, 1.
Pellagra.—Cases: Savannah, 3.
Typhus.—Cases: Atlanta, 1; Montgomery, 3.
Rabies in man.—Deaths: Los Angeles, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended December 29, 1934.—During the 2 weeks ended December 29, 1934, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				3	1				1	5
Chicken pox		31	7	380	610	89	199	23	119	1,467
Diphtheria		4	3	34	8	14	2	4	2	71
Dysentery				5	2					7
Erysipelas		1		6	5	3		1	3	19
Influenza		12		4	28				15	59
Measles		324	7	711	359	686	566	15	17	2,685
Mumps					195	8	2	30	49	284
Pneumonia		6			15				8	29
Poliomyelitis		1		2	1					4
Scarlet fever		9	28	268	263	51	23	29	68	739
Trachoma						1				1
Tuberculosis	1		11	63	43	4	6	4	28	163
Typhoid fever			3	13	8	1		2	2	29
Undulant fever					2		2			4
Whooping cough		8	6	189	228	9	20	5	33	498

CEYLON

Malaria.—According to information dated December 29, 1934, the epidemic of malaria in Ceylon was invading new regions, but its spread was becoming less rapid. In the district of Kegalla, which was one of those most severely affected, the epidemic was thought to have reached its peak and conditions were said to be improving. The disease is principally of the subtertian type, and the mortality has been low. Treatment centers had been established in all parts of the affected regions. A previous note in regard to the epidemic was published on page 34 of PUBLIC HEALTH REPORTS for January 4, 1935.

EGYPT

Vital statistics—1932—Comparative.—The following vital statistics for Egypt in all localities having a health bureau are taken from the Annual Return of Births, Deaths, and Infectious Diseases. In 1932, there were 41.1 live births per 1,000 population compared with 43.2 in 1931. Deaths under 1 year of age per 1,000 live births were

174 in 1932, and 160 in 1931. The following table shows the deaths per 100,000 population from certain causes for 1932 and 1931:

Cause	Deaths per 100,000 population		Cause	Deaths per 100,000 population	
	1932	1931		1932	1931
Cancer	21.80	19.19	Nephritis (acute)	18.25	16.48
Broncho-pneumonia	185.11	154.56	Nephritis (chronic)	58.00	58.08
Cerebral hemorrhage	21.41	24.25	Paratyphoid fever	.61	.78
Cerebrospinal meningitis	35.79	10.15	Pellagra	8.21	7.16
Chicken pox	.30	.28	Pneumonia (lobar)	7.96	7.21
Diarrhea and enteritis (under 2 years)	795.03	795.62	Poliomyelitis	.05	.17
			Rabies	.42	.40
Diphtheria	16.04	17.01	Scarlet fever	.12	.09
Dysentery (amoebic)	.65	.69	Smallpox	3.16	----------
Dysentery (bacillary)	.23	.38	Syphilis	10.02	8.41
Erysipelas	8.05	7.40	Tetanus	3.84	4.36
Influenza	4.19	3.91	Tuberculosis (all forms)	51.79	49.58
Lethargic encephalitis	.07	.17	Typhoid fever	11.31	13.13
Malaria	.26	.36	Typhus fever	2.09	.45
Measles	45.36	37.65	Undulant fever	.05	.02
Mumps	.30	.47	Whooping cough	2.51	1.42

IRISH FREE STATE

Vital statistics—Third quarter 1934.—The following statistics for the Irish Free State for the quarter ended September 30, 1934, are taken from the Quarterly Return of Marriages, Births, and Deaths, issued by the Registrar General, and are provisional:

	Number	Rates per 1,000 population		Number	Rates per 1,000 population
Population	3,013,000	----------	Deaths from—Continued		
Marriages	3,937	5.20	Influenza	67	0.09
Births	14,701	19.50	Measles	8	----------
Total deaths	8,243	10.90	Puerperal sepsis	17	[2] 1.16
Deaths under 1 year	818	([1])	Scarlet fever	14	----------
Deaths from—			Tuberculosis (all forms)	741	.98
Cancer	762	1.01	Typhoid fever	16	----------
Diarrhea and enteritis (under 2 years)	153	----------	Typhus fever	1	----------
Diphtheria	60	----------	Whooping cough	65	----------

[1] Deaths under one year per 1,000 live births, 56. [2] Per 1,000 births.

PUERTO RICO

Notifiable diseases—4 weeks ended December 29, 1934.—During the 4 weeks ended December 29, 1934, cases of certain notifiable diseases were reported in the municipalities of Puerto Rico, as follows:

Disease	Cases	Disease	Cases
Chicken pox	31	Pink eye	1
Diphtheria	29	Poliomyelitis	1
Dysentery	18	Ringworm	11
Erysipelas	3	Scarlet fever	1
Filariasis	1	Syphilis	35
Influenza	107	Tetanus	1
Malaria	1,822	Trachoma	3
Measles	29	Tuberculosis	698
Mumps	29	Typhoid fever	8
Opthalmia neonatorum	1	Whooping cough	205
Pellagra	1		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following table must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		May 27–June 30, 1934	July 1–28, 1934	July 29–Aug. 25, 1934	Aug. 26–Sept. 29, 1934	Week ended— Oct. 1934 6	Oct. 13	Oct. 20	Oct. 27	Nov. 1934 3	Nov. 10	Nov. 17	Nov. 24	Dec. 1934 1	Dec. 8	Dec. 15	Dec. 22	Dec. 29
Ceylon: Colombo	C	1																
China:																		
Amoy	C		[1] 1															
Canton	C	1																
Fort Bayard	C	1																
Hankow	C		2															
Shanghai	C		2	1														
Tientsin	C	1																
India	C	22,932	39,303	58,347	53,096	5,377	4,628	3,809	5,346	3,233	3,563	4,724	4,656					
	D	12,315	21,179	29,499	26,643	2,543	2,245	1,969	2,767	1,627	1,943	2,494	2,495					
Assam	C							5	38	39	17	56	215	105	243			
	D								22	18	8	21	86	64	83			
Bassein	C													1	1	4	5	4
	D															2	4	3
Bombay Presidency	C	830	2,985	11,361	5,971	591	621	341	420	270	129	256			181			
	D	393	1,005	4,125	2,355	246	306	182	191	105	66	115			88			
Bombay	C	3	1	1	2													
Calcutta	C	476	294	182	183	27	22	27	34	28	15	18	17	25	10	46	36	49
Chittagong	C	6	9	2	1				1				1	1	3	3	1	4
Madras Presidency	C	1,410	2,463	6,883	3,647	378	239	270	211	500	418	511	672					
	D	729	1,093	3,184	1,695	169	134	123	100	134	203	255	303					
Madras	C	25	5	145	60	3	3		1	16	27	14	2	3	3	8	5	8
	D	15	3	55	29	3	2			3	14	13	2	1		3	4	4
Negapatam	C									[2] 1								
Punjab	C				35													
	D				25													
Rangoon	C				1									1				
Vizagapatam	C			4	6													

[1] Suspected.

[2] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

Place		May 27–June 30, 1934	July 1–28, 1934	July 29–Aug. 25, 1934	Aug. 26–Sept. 29, 1934	Week ended— October 1934: 6	13	20	27	November 1934: 3	10	17	24	December 1934: 1	8	15	22	29
India (French):																		
Chandernagor	D	2	6		1				1									
Karikal	C		1	16	47	2	3					2						
Pondichery	C		6	106	59					10								
Indo-China (see also table below):																		
Baclieu	D	2																
Pnom-Penh	C			2												1	1	
	D		1															
Poulo Condor Island	C	3																
Philippine Islands: Rizal Province—Manila	C	1																
Siam	C	1	1															
On vessels:																		
S. S. *Cape Ortegal* at Calcutta from Bombay	C	1																
S. S. *Jaladurga* at Calcutta from Rangoon	C	2																
S. S. *Khostan* at Calcutta from Karachi	C		1															
S. S. *Erinpura* at Port Swettenham	C			1														
S. S. *Aronda* at Rangoon from Calcutta	C				1													

Place		July 1934: 1–10	11–20	21–31	August 1934: 1–10	11–20	21–31	September 1934: 1–10	11–20	21–30	October 1934: 1–10	11–20	21–31	November 1934: 1–10	11–20
Indo-China (French) (see also table above):															
Cambodia [3]	C	1	1		2						1			3	
	D	1	1		1						1			3	
Cochin-China [3]	C	4	2	6	1		2			1				1	2
	D	4	2	4	1		1			1				1	2

[3] Reports incomplete.

PLAGUE[1]

Place		May 27–June 30, 1934	July 1–28, 1934	July 29–Aug. 25, 1934	Aug. 26–Sept 29, 1934	Week ended— October 1934 6	13	20	27	November 1934 3	10	17	24	December 1934 1	8	15	22	29
Argentina (see also table below): Santiago de Estero Province—Frias	C														1			
Azores. (See table below.)																		
Belgian Congo	C	6	8								8	2	4					
Brazil:																		
Alagoas State	C															5		
	D															2		
Ceara State	C														2			
British East Africa (see also table below):																		
Kenya	C	9	1	5	13	1				1	2	2		1				
Uganda	C	215	131	101	70	18	23	22	26	18	16	23	22	33	13			
	D	205	122	101	69	18	22	22	23	16	16	21	22	34				
Ceylon: Colombo	C		1		1							1	1					1
	D	1	1									1	1	1				
Plague-infected rats					1					3								
China (see also table below):																		
Fort Bayard.[2]																		
Manchuria[3]	D		22	8														
Tanghai Island	C	7																
Dutch East Indies:																		
Java—Batavia	C					[4] 2	3											
	D					2	3											
West Java	C	1,273	1,148	1,721	2,201	468	418	427	371									
	D	1,273	1,144	1,720	2,201	468	418	427	371									
Ecuador.[5] (See table below.)																		
Egypt:																		
Alexandria—Plague-infected rats		P	P	P	P		P		P		P		P		P			
Asyut	C	6											2					
Beni-Suef	C									1								
Gharbiya	C	6	22															
	D	2	6															
Minufiya	C	8																
Minya	C	8																

[1] Including plague in the United States and its possessions.

[2] During the week ended June 2, 1934, suspected cases of plague were reported in Fort Bayard, Kwangchowan Territory, China.

[3] A report dated Oct. 30, 1934, states that from June to Oct. 25, 1934, deaths from plague had been reported in Manchuria, China, as follows: Fengtien Province, Liaoyuan, 30, Shuangshan, 21, Tungliao 41; Kirin Province, Changling, 12, Chienan, 26, Fuyu, 32, Hsinking City, 1, Nungan, 168.

[4] Imported.

[5] A report dated Jan. 8, 1935, states that 1 case of plague was reported at Amaluza, Province of Loja, Ecuador.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		May 27–June 30, 1934	July 1–28, 1934	July 29–Aug. 25, 1934	Aug. 26–Sept. 29, 1934	Week ended— October 1934: 6	13	20	27	November 1934: 3	10	17	24	December 1934: 1	8	15	22	29
Hawaii Territory:																		
Hawaii Island—Hamakua district—																		
[1] Kalopa—Plague-infected rats									1	1			2					
[2] Kukaiau—Plague-infected rats		1																
Paauhau	C									1								
	D									1								
Plague-infected rats		1						1										
Paauilo	C	1																
Pohakea—Plague-infected rats									1									
Maui Island—Makawao district—																		
Kahului (9 miles from)—Plague-infected rats							2											
Paia—Plague-infected rats							1											
India	C	774	921	3,032	6,640	1,556	1,567	1,318	1,171	1,117	826	1,043	1,181					
	D	657	578	1,777	3,981	867	847	737	663	607	509	613	695					
Bassein	C	7	5	5	1	1		1			2	1						1
Plague-infected rats		1	1	3	3		1						1					
Bombay Presidency	C	218	379	1,464	2,929	731	765	650	613	471	406	485			300			
	D	143	220	842	1,760	405	431	401	323	278	235	286			176			
Bombay	C	1	1		1													
Plague-infected rats		2			2		1											
Madras Presidency	C	42	194	333	553	96	84	74	55	45	19	55	111					
	D	15	98	165	296	44	57	47	35	19	10	21	42					
Moulmein	C			1														
	D			1														
Punjab	C					P		18	11	13	8	29	3	10	17	8	11	
	D							10	7	8	6	20	1	8	13	7	6	
Rangoon	C	5	1	1	3													
Plague-infected rats		3		1										1				
Indo-China (see also table below):																		
Bentre	C			1														
Longxuyen	C	1																
Pnom-Penh	C	1		1	3			2					1			1	1	
Sadec	C	1																
Saigon and Cholon	C	4	1	1	1						1	1						
Vinhlong	C	1																

Iraq: Baghdad	C	3	1															
Libya	C	5																
	D	1																
Madagascar. (See table below.)																		
Morocco: Tangier	C									4	3							
Peru (see also table below): Salaverry—Plague-infected rats		1																
Senegal. (See table below.)																		
Siam	C	2																
Prachin—Nagara Nayok	C																	4
Rajpuri.[6]																		
South-West Africa.[7]																		
Tunisia: Tunis—Plague-infected rats		4																
Union of South Africa: Orange Free State	C							2	1			2	1					
United States: California:																		
Human plague—Tulare County	C	1																
Plague-infected ground squirrels:																		
Modoc County		[8] 26	2															
Tulare County		6																
On vessel: S. S. *Barjora* at Rangoon from Moulmein	C				1													
	D				1													

Place		June 1934	July 1934	August 1934	September 1934	October 1934	November 1934
Argentina (see also table above)	C	2	2	6	11		
Azores	C	3	5	5	2		
British East Africa (see also table above):							
Kenya	C	6		13	5	1	
Uganda	C			103	54		
China: Kwangchowan	C	21	10	3			3
	D	12	4	3			3
Ecuador	C	7					
Indo-China (see also table above):							
Cambodia	D	4	2	3	3	4	2
Cochin-China	C	9	8	2	1		2
Madagascar (central region)	C	71	97	160	291	444	431
	D	71	96	158	283	422	410

Place		June 1934	July 1934	August 1934	September 1934	October 1934	November 1934
Peru (see also table above)	C	1		1			2
Lima department	C				2	3	1
Senegal:							
Dakar [9]	C	33	55	52	17	13	4
	D	27	47	47	19	11	3
Diourbel [9]	C			5	1		
	D			3	1		
Louga [9]	C	2					
	D	2					
Rufisque [9]	C	18	33	42	15	8	4
Theis [9]	C	64	50	39	6	6	
Tivaouane [9]	C	32	27	52	26	21	3

[6] During the week ended Jan. 5, 1935, 1 case of plague was reported at Rajpuri, Siam.
[7] From January to June 30, 1934, 20 cases of plague were reportedin Ovamboland, South-West Africa.
[8] Includes 1 plague-infected wood rat.
[9] Reports incomplete.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P. present]

Place		May 27–June 30, 1934	July 1–28, 1934	July 29–Aug. 25, 1934	Aug. 26–Sept. 29, 1934	Week ended— October 1934 6	13	20	27	November 1934 3	10	17	24	December 1934 1	8	15	22	29
Algeria:																		
Algiers Department	C	1	1						1									
Constantine Department	C	2			1				1									
Oran Department	C	3																
Angola. (See table below.)																		
Belgian Congo[1] (see also table below)	C		1	2	5													
Bolivia. (See table below.)																		
Brazil:																		
Porto Alegre (alastrim)	C	2	2	5	2		1											
Sergipe State	C										P							
British East Africa:																		
Kenya	C	13	93	169	116			25	5	11	1	4	1	5	5			
Tanganyika	C	40	2	6	43	2		1	15		12	2		20				
British Somaliland	C		16		7	1	2		4	2			3					
British South Africa:																		
Northern Rhodesia	C	28			16													
Southern Rhodesia	C			2	1		2											
Cameroun (French). (See table below.)																		
Canada:																		
Alberta	C											1	1	1				
British Columbia	C			[2] 1														
Manitoba	C				[2] 1			[2] 1										
Saskatchewan	C					[2] 1		[2] 1		[2] 1								
Canary Islands: Santa Cruz de Tenerife	C													2	1			
Ceylon: Colombo	C				17	2	1			2	1	3	5		10	1		
China:																		
Amoy	C	22	6	3						1								
Canton	C	1									1		2		2	3		
Dairen	C	15	6		2													
Foochow	C	P	P	P	P	P		P		P		P		P				
Hangchow	C		2															
Hankow	C	1			1		1						1	1	1			
Hong Kong	C	10			1					1		[3] 1						
Kwantung Leased Territory	C	24																

Macao	D	1								1		1	1				15	10
Shanghai	C	25	8	3	1			1	1				1		2	3	1	2
South Manchuria Railway Zone	C	18																
Swatow	C	7		1														
Tientsin	C	1	2					2			3		1	1				
Tsingtao	C			1				1				2	1					
Chosen. (See table below.)																		
Dahomey. (See table below.)																		
Dominican Republic: Santo Domingo	C	1																
Ecuador. (See table below.)																		
Egypt:																		
Alexandria	C			2														
Aswan	C	3	4															
Asyut	C	2																
Cairo	C	3	1	4	1													
Dakahliya	C																	
Damietta	C	1																
Faiyum	C	35	2		1													
Gharbiya	C	4																
Girga	C	7	4															
Minya	C	5	15	3	2													
Qena	C	4																
Sharkiya	C							41	33									
Provinces	C	59	33	31	13	3	1	42		3								
Eritrea	C			1														
Finland. (See table below.)																		
France. (See table below.)																		
Gold Coast. (See table below.)																		
Great Britain:																		
England and Wales	C	10	3		1		1				1							
London	C	7					1											
London and Great Towns	C	8			1		1											
Greece: Salonika	C	9	7	8			1	1	1									
Guatemala. (See table below.)																		
Honduras:																		
Belize	D	1																
Tegucigalpa	C	P		1	2													
Tela	C														5	1	1	
India	C	29,379	16,341	12,784	8,838	998	1,270	960	1,195	1,365	1,555	1,856	2,387					
	D	7,028	3,966	3,269	2,105	198	227	204	217	261	318	370	482					
Bassein	C	5	1	1														
	D	1	1	1														
Bombay Presidency	C	2,863	1,000	1,131	1,102	141	170	135	182	267	130	316			473			
	D	555	249	237	200	36	36	26	31	34	12	72			113			
Bombay	C	13	5	4	14	1	1	6		1	1	3			4	1	8	9
	D	9	2	3	6	3	1	1		1	1	2			2		3	6
Calcutta	C	73	23	7	16	1	2					4			5	10	22	14
	D	60	18	8	9							1			3	5	15	9

[1] A report dated Oct. 23, 1934, states that 142 cases of smallpox with 10 deaths have been reported in Belgian Congo.
[2] For 2 weeks.
[3] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		May 27–June 30, 1934	July 1–28, 1934	July 29–Aug. 25, 1934	Aug. 26–Sept. 29, 1934	Week ended— October 1934 6	Oct. 13	Oct. 20	Oct. 27	November 1934 3	Nov. 10	Nov. 17	Nov. 24	December 1934 1	Dec. 8	Dec. 15	Dec. 22	Dec. 29
India—Continued.																		
Cochin	C	1																
Karachi	C	7	13	6	3												4	
Madras Presidency	C	6,223	3,576	3,397	2,920	579	760	683	677	658	739	685	671					
	D	1,162	588	616	515	93	97	125	99	96	91	123	133					
Madras	C	35	34	19	22	7	8		1		2	1	2		7	8	2	2
Negapatam	C	8	7	4	3	1	4		3		1	1	1		2	10	2	10
Punjab	C								5	11	20	16	13	21	80	38	86	
Rangoon	C	10	6	3	2		2	1			2	1			1			2
Tuticorin	C		6		3	1		1							2	1		
Vizagapatam	C	4	3	8	1							5	11		11	8	5	
India (French):																		
Chandernagor	D	2	1	2	1													
Karikal	C				1	1						1		2				
Pondichery	C	131	131	170	236	40	33		26	35		36	18	34				
	D	72	78	103	147	38	19		24	10		19	16	22				
India (Portuguese)	C			27														
Indo-China (see also table below):																		
Haiphong	C	7			1													
Pnom-Penh	D			1														
Tourane	C	24	17	9	3	3			1		3			1			1	3
Iraq	C	88	13	5	11	2	1						1	10				
Arbil	C		15		6	2								1				
Baghdad	C	1		2	[3] 1	1												
Basra	C														1		5	
Italy:																		
Genoa	C			8	2													
Milan	C				2													
Ivory Coast. (See table below.)																		
Japan	C	7	6									1						
Aomori Prefecture	C		3															
Kobe	C		1															
Osaka	C	2																

Liberia.[4]																		
Mexico:																		
Allende.[5]																		
Chihuahua	C		1		1						2			1	2	2	7	5
Mazatlan.[3]																		
Mexico, D. F.	C	12	5	6	8	5	1											
Monterrey	C			1														
San Luis Potosi	D		1											1				
Teitipac.[6]																		
Torreon	D	1																
Morocco. (See table below.)																		
Mozambique. (See table below.)																		
Nigeria	C	136		239	215	17	82	24	36		115							
Lagos	C	9	2	3	5													
Nyasaland. (See table below.)																		
Palestine	C	7												1				
Persia	C		2	3	2	2	4	1		1	3			1				
Teheran	C		7	1							1	1		1				
	D	1			1				1	1								
Peru. (See table below.)																		
Poland	C		1		1			1				1						
Portugal (see also table below):																		
Lisbon	C	6	4			1			1	1	1							
Oporto	C				1					1						1		
Portuguese East Africa. (See table below.)																		
Salvador	C	35	[2] 21	30	12	[2] 13				9			1			[7] 27	10	
Siam	C	26	6		32	2	1		1	13								
Sierra Leone	C	226	67	80	385		[2] 89		[4] 125		[2] 60				[2] 129			
Spain	C	131	54	47	29	3	5	6	8	36	54	8	7	7	29	15		
Straits Settlements: Singapore	C							1	1									
Sudan (Anglo-Egyptian)	C	7	3	4	1			1					1			1		11
Syria:																		
Beirut	C			2														
Damascus	C											26	7	26	19		4	
Provinces	C	31	50	32	78	13	14	11	13	15	35	39	27	49	30		18	
Trans-Jordan	C	2	1								[3] 1							
Turkey. (See table below.)																		
Union of South Africa	C		P	P	P													
Union of Soviet Socialist Republics. (See table below.)																		

[2] For 2 weeks.

[3] Imported.

[4] A report states that from February to Sept. 10, 1934, 233 cases of smallpox with 79 deaths had been reported in Sanoyea, Liberia. All sanitary measures have been taken.

[5] A report dated Dec. 28, 1934, states that about 48 cases of smallpox with 5 or 6 deaths had been reported at Allende, Mexico.

[6] A report dated Aug. 27, 1934, states that smallpox has appeared in the suburbs of Mazatlan, Sinaloa, Mexico; the report also states that 101 deaths from smallpox have occurred in Teitipac, Oaxaca, Mexico.

[7] For 3 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

On vessels:
S. S. *Britannia* at Port Said from Liverpool 1 case May 31, 1934
S. S. *Rohna* at Penang from Madras 1 case June 14, 1934
S. S. *Rajula* at Penang 1 case June 28, 1934
S. S. *Rohna* at Penang from Madras 1 case July 12, 1934
S. S. *Tacoma* at Moji from Dairen 1 case July 28, 1934
S. S. *Ethiopa* at Rangoon from Madras 1 case Sept. 3, 1934

On vessels—Continued.
S. S. *Tsuri Maru* at Kobe from Dairen 1 case Sept 24, 1934
S. S. *Rohna* at Penang from Madras 1 case Oct 4, 1934
S. S. *Erinpura* at Rangoon from Madras 1 case Oct. 8, 1934
S. S. *Kuang-Si* at Jibuti 1 case Nov 24, 1934
S. S. *Varela* at Basra 1 case Dec 8, 1934

Place		June 1934	July 1934	August 1934	September 1934	October 1934	November 1934
Angola	C		72	65			
Belgian Congo (see also table above)	C	110	360	204	183		
Bolivia	C		82	136	70		
Cameroun (French)	C		1				
Chosen	C	25	18	5	15	40	
Dahomey	C		83	31	10	6	
Ecuador	C		1				
Finland	C		1				
France	C			3	2	3	53
Guatemala	C			1		2	1
Indo-China (see also table above)	C	215	192	150	87	202	258
	D	39	29	39	18	39	22

Place		June 1934	July 1934	August 1934	September 1934	October 1934	November 1934
Ivory Coast	C	4	2				
Morocco	C	2	5	2	8		7
Mozambique	C		3	4	6	1	36
Nyasaland	C	63	31	16	29	17	29
Peru	C	29	24	100	12		
Portugal (see also table above)	C	40	70	60	36		
	D	5	4	6	2		
Portuguese East Africa	C	5	3	4	6	1	
Turkey	C	2	17	4	16	2	
Union of Soviet Socialist Republics	C	403					

TYPHUS FEVER

Place		May 27-June 30, 1934	July 1-28, 1934	July 29-Aug. 25, 1934	Week ended—															
					September 1934					October 1934				November 1934				December 1934		
					1	8	15	22	29	6	13	20	27	3	10	17	24	1	8	15
Algeria:																				
Algiers Department	C	18	1	1						1			3	2	1	1				
Constantine Department	C	91	32	12	3	1	1			1			3					1		
Bone	C			1	1															
Constantine	C												2				2	1		
Oran Department	C	5	2	10														1	1	
Basutoland	C								20											
Belgian Congo	C	208	135	108	13	19	13	12	5	4	7	6	3	4	4	1	3		2	
Bolivia. (See table below.)																				
British East Africa: Uganda	C	6		1										10						
Bulgaria	C	19	2									2	5			5	2		1	3
Chile	C	1,044	1,180	1,188	365	338														
Concepcion	C		13		10	4														
Iquique	C									1 [1]										
Santiago	C	321	365	185	152	102														
Tarapaca Province.[2]																				
Tocopilla	C						1													
Valparaiso	C	22	20	21	3	8	6	2	2		6	3	8	10	9	6	8	16	15	15
China:																				
Hangchow	C	1																		
Hankow	C	1								1										
Harbin	C	3																		
Nanking	C	3																		
Shanghai	C	3				1														
South Manchuria Railway Zone	C	3																		
Tientsin	C	2																		
Chosen. (See table below.)																				
Czechoslovakia. (See table below.)																				
Egypt:																				
Alexandria	C	9	2	1								1					2	2	1	1
Aswan	C																			
Asyut	C	4	1															3		2
Beheira	C	263	52	31		1														
Cairo	C	1	2														1			
Dakahliya	C	67	17	7													1			
Damietta	C	2	1								1									1

[1] Imported.
[2] A report dated July 13, 1934, states that 41 cases of typhus fever with 7 deaths have been reported in the villages of Usmagama and Pachica, Tarapaca Province, Chile.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		May 27-June 30, 1934	July 1-28, 1934	July 29-Aug. 25, 1934	Week ended— Sept. 1934: 1	8	15	22	29	Oct. 1934: 6	13	20	27	Nov. 1934: 3	10	17	24	Dec. 1934: 1	8	15
Egypt—Continued.																				
Faiyum	C	2									1									
Gharbiya	C	103	71	22		1		2			1						6		1	
Girga	C	1		1																
Minufiya	C	87	26	5												4	11	4	2	3
Minya	C			1																
Port Said	C	4													1		1			
Qena	C	13	1	6							1	2					1		2	2
Sharkiya	C	22	15	3		1													1	
Provinces	C	695	176	98	13	4	10	2	6	2	3	3	2	2		5	22	9	7	9
Estonia	C			1																
Greece (see also table below): Salonika	C			6				1	1	1	1		1	1	1	1	1	1	1	1
Guatemala. (See table below.)																				
Hungary	C							1										6		1
Iraq	C	65																		
Baghdad	C	4		3	1					1									1	
Kirkuk liwa	C	59																		
Mosul liwa	C		14	3			3													
Irish Free State:																				
Cork County—Castletown	C		5																	
Waterford County—Lismore	C					1				1										
Wicklow County—Altidore	C		7																	
Italy:																				
Leghorn	C			2		2	1	1					1							
Palermo	C		1																	
Japan:																				
Aomori Prefecture	C			3																
Kobe	C									1										
Nagasaki	D							1												
Latvia. (See table below.)																				
Lithuania	C	4	17	7				2			2		1		1			1	8	4

Mexico:																				
Guadalajara	D					1														
Mexico, D. F.	C	108	38	34	4	11	6	5		8	6									
Saltillo	D						2				1									
San Luis Potosi	D	1	1							1		1								
Torreon	C		1	1							1		4			1				
Morocco	C	45	18	43	1									1				7	2	6
Palestine	C	4	5	1	2		1			1	1	2								
Haifa	C		[1] 1	1	1					1	[1] 1	[1] 1	[1] 1			[1] 2	[1] 2		2	
Persia	C	217	112	49	17	5	6	10	9	4	8		7	10	5		3	5	10	
Teheran	C	22	25	7	2		2	3	3	1										
Peru. (See table below.)																				
Poland	C	284	148	77	10	13	9	8	13	13	9	13	13	14	12	16	19	27	12	
	D	23	12	6			1			3	1		1	2	1	3	3	4	3	
Portugal[4] (see also table below): Oporto	C		1			1													2	
Rumania. (See table below.)																				
Spain: Catalonia	C	27																		
Straits Settlements: Singapore	C		2																	
Syria: Beirut	C			1																
Trans-Jordan	C	16	4	4																
Tunisia:																				
Tunis	C	22	1	1							1			1				3		
Provinces	C	99	46	14		1	2		15	2		4	16	18	1	14	2	10	1	8
Turkey. (See table below.)																				
Union of South Africa. (See table below.)																				
Union of Soviet Socialist Republics. (See table below.)																				
Yugoslavia. (See table below.)																				

Place		June 1934	July 1934	August 1934	September 1934	October 1934	November 1934
Bolivia	C	46	39	91	33		
Chosen	C	6	41	23	7	22	
Czechoslovakia	C	20	3				
Greece	C		9	10	7	6	
Guatemala	C	18	24	36	31	18	18
Latvia	C					3	
Peru	C	59	43	24	63		
Portugal	C	21		4	7		
Rumania	C	73	16	24	16	48	30

Place		June 1934	July 1934	August 1934	September 1934	October 1934	November 1934
Turkey	C	15	9	22	10	16	20
Union of South Africa:							
Cape Province	C	250	289	272	437	107	
Natal	C	10	26	15	6	29	
Orange Free State	C	884	709	510	492	403	
Transvaal	C	38	24	12	105	32	
Union of Soviet Socialist Republics	C	1,889					
Yugoslavia	C	118	58	27	12	31	3

[1] Imported.
[3] Includes 1 imported case.
[4] A report dated Jan. 11, 1935, states that 26 cases of typhus fever have been reported near Tarouca, Vizeu Department, Portugal. All sanitary measures have been taken.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		May 27-June 30, 1934	July 1-28, 1934	July 29-Aug. 25, 1934	Week ended— September 1934: 1	8	15	22	29	October 1934: 6	13	20	27	November 1934: 3	10	17	24	December 1934: 1	8	15
Brazil:																				
Amazonas State—Fonte Boa	C		1																	
Bahia State: Victoria Bank	C	1																		
Ceara State:																				
Carius	C	1																		
Iguatu	D		1	1																
Novo Oriente	C		1																	
Santa Quiteria	C	1																		
Mato Grosso State: Coronel Ponce.[1]																				
Colombia: Intendencia of Meta—Restrepo	D												1							
French West Africa—Guinea—Kindia	C						1													
Gambia:																				
Bathurst[2]	C															1				
St. Mary's Island	C															[3] 2				
Gold Coast:																				
Kokobee	C																1			
N'Kaw Kaw	C		1																	
Ivory Coast:																				
Abidjan	C	3							1											
	D	2	1						1											
Agboville	C						1													
Bingerville	C			1																
Bobo-Dioulasso	D											[3] 1								
Dibro	C																		3	
	D																		1	
Diekekro	C																			1
Tirailleur	C												1							
Toumodi[4]	C																		15	
	D																		10	
Zuenoula	C																		1	
Nigeria: Kano	C																			2

Niger Territory:	C					1															
Maradi	C		1	5							1										
Zinder	D		1	4							1										
Sudan (Anglo-Egyptian): Wau	C	1																			

1 During the month of October 1934, 1 case of yellow fever was reported in Coronel Ponce, Mato Grosso State, Brazil.
2 For the week ended Dec. 22, 1934, 2 cases of yellow fever with 2 deaths were reported at Bathurst, Gambia.
3 Suspected.
4 For the period Dec. 21–31, 1934, 1 case of yellow fever was reported at Toumodi, Ivory Coast.

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HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg. Gen R. C. WILLIAMS, *Chief of Division*

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PUBLIC HEALTH REPORTS

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THE EFFECTS OF EXPOSURE TO DUST IN TWO GEORGIA TALC MILLS AND MINES

By WALDEMAR C. DREESSEN, *Passed Assistant Surgeon*, and J. M. DALLAVALLE, *Assistant Sanitary Engineer, Office of Industrial Hygiene and Sanitation, United States Public Health Service*

The study herein described was carried out at the request of the Georgia State Department of Health in order to ascertain whether there is a connection between talc dust exposure and the relatively high tuberculosis death rate in Murray County, Ga., where two talc mills and mines are located. The study follows in outline the general procedure adopted by the Office of Industrial Hygiene and Sanitation in its studies of dusty trades and includes a survey of plant and mine conditions and the results of examinations made on a group of workers engaged at any time in the production of talc products. In contrast with the results of another study on the effects of talc dust exposure (1), the present investigation deals with a form of talc primarily adapted to the manufacture of marking pencils for the steel and building construction trades. Such talc powder is a by-product obtained from the waste incident to the sorting and cutting of raw talc.

The cutting of talc pencils and the crushing and milling of the waste were done in very close quarters. In fact, in one of the mills studied both operations were carried on in the same room. Consequently, it was difficult to obtain a true picture of the occupational exposures of various workers and to compare the results with those obtained in the previous study (1) referred to. Furthermore, in contrast with the previous study both plants were small and no provisions for exhausting the dust at the sources of generation were in evidence.

PROCEDURE AND INSTRUMENTS USED IN THE STUDY

The sanitary and occupational survey methods recently described by Bloomfield (2) were employed in the present study. These methods embody the principle that in any investigation regarding the health of workers, it is first necessary to study the environmental factors. This includes an "inventory" of all sanitary facilities, lighting, ventilation, etc.; and an evaluation of these items was based on the best practice specified by State or other accepted codes. Following such a survey a study of each worker's activities is made.

This is important, for it has been shown in the dust studies conducted by the Public Health Service that a worker's duties do not generally limit him to a single dust concentration through the entire working day. Consequently, in order to arrive at a fair estimate of the worker's actual daily dust exposure, it is necessary to know the time spent in each activity.

Dust sampling.—In obtaining dust samples, the Greenburg-Smith impinger (3) and the Owens' jet (4) apparatus were used. The former was employed for obtaining samples for the estimation of dust concentrations in accordance with the technique devised by the Public Health Service and the latter for obtaining small grab samples for particle size measurements.

NATURE OF TALC DUST

According to Ladoo (5) the Chatsworth talc deposits are steatite (hydrous magnesium silicate, $H_2Mg_3(SiO_3)_4$). This is ordinary talc, or soapstone, as distinguished from pyrophyllite, the hydrous aluminum silicate, deposits of which are found in North Carolina. Chatsworth talc rock is greenish-gray in appearance, firm, and translucent when cut into thin slabs. In the form of powder, the talc is grayish-white and finds its chief market in the manufacture of rubber and paper.

The importance of quartz as the chief causative agent in the production of disabling pneumoconiosis is well known. In an analysis of dust samples, therefore, it is of prime importance to obtain an estimate of the quartz content. The Office of Industrial Hygiene and Sanitation has for a number of years secured analyses both petrographically and chemically of the samples of dust obtained in its various studies. Three samples of dust submitted for petrographic analysis showed the following results:[1]

Talc as fibrous splinters, fibrous aggregates, and foliated masses, approximately 70 percent.

Dolomite as broken rhombs, from 20 to 30 percent.

Tremolite in two samples as bladed crystals, 10 percent.

No quartz was found except as occasional fragments. The same samples were submitted to Associate Chemist Frederick Goldman for chemical analysis. The results are presented in table 1.

TABLE 1.—*Analysis of talc samples*

Sample number	Location taken	SiO_2	CaO	MgO	Combined oxides
1	Breast in mine	39.85	8.23	28.52	6.92
2	Talc mill near crusher	16.21	4.51	27.06	13.12
3	Talc as marketed	40.04	4.39	26.20	15.61

[1] We are indebted to Mr. Allen H. Emery and Dr. A. Gabriel, of the Bureau of Mines, for conducting the petrographic analyses of samples.

In the previous talc study, the amount of tremolite found was more than four times that reported above. However, no free silica was found in either study. The chemical analyses of both studies are comparable except in the case of the combined silica (determined as SiO_2), which in the previous study was given as 56.54 percent.

Two samples were taken with the Owens jet dust counting apparatus and 100 particles were measured in each sample with a filar micrometer at a magnification of 1,000. The median size of particles was found to be 0.4 micron. Approximately 35 percent of the particles were larger than 0.5 micron.

DESCRIPTION OF PLANTS, OPERATIONS, AND OCCUPATIONS

Description of plants.—The two plants studied represent extreme types of construction, one being modern and the other consisting of a series of dilapidated wooden sheds. In the newer plant, the sawing and milling operations are carried on in separate, detached rooms, while in the older one all work is done in what may be described as a single large room.

From a sanitary point of view, neither plant had adequate lighting, except in the packing and sorting rooms, where good lighting was a necessity. One plant had no artificial lighting. Water was obtained from an outdoor faucet, thus requiring the use of the common drinking cup and pail. The newer plant, while having electric lights, did not possess much better sanitary facilities.

Operations and occupations.—The operations in the plants may be divided into two classes—pencil cutting and talc crushing and milling. In the former, the raw material from the mine is carefully selected and cut into blocks by a large circular saw. In both plants this work is conducted by one man known as a "blocker." His work requires considerable experience in choosing suitable pieces of talc with straight and uniform grain. The blocks thus selected and cut are in turn sawed into smaller sizes and passed on to a "slabber", or "facer", whose work consists in cutting the blocks into thin slabs. These slabs are again sawed by the pencil makers who use a small fine-toothed saw. The final step then consists in pointing or rounding the pencils in accordance with market requirements. All the above-mentioned operations are carried out on a long bench called the sawyer's bench. The final operations of sorting and packing are done by girls in separate rooms adjoining.

Pencilmaking, as might be expected, entails a great deal of waste. Talc is soft and frequently brittle and the sawing of it into thin slabs and pencils causes much breakage. The manufacture of talc powder merely consists in the crushing, milling, and screening of such talc waste and knurled talc rock which cannot be used for pencils. The milling process does not differ materially from that described in the

earlier study, except that in the present case the operations are on a smaller scale and employ only two men per plant, a crusherman and a packer. The former shovels the raw talc in the crusher or conveyor belt while the latter "bags" the talc. The filling process consists of lowering and raising a telescoping duct from a hopper into a paper or cloth sack. Each sack is filled to the proper weight and any excess is removed with a small scoop. The loaded bags are carried to the storing and shipping room by a helper.

DESCRIPTION OF MINING OPERATIONS AND OCCUPATIONS

The mines of the Chatsworth region consist of small openings at the base of Conutta Mountain, with short tunnels and chambers pitched downward into the talc seam. The talc lies in pockets, which, in mining, frequently necessitates occasional exploration through rock. The mines are laid with narrow-gage track on which operates a small "buggy" connected by cable from the engine house outside the mine. Mine pillars for support of the roof are not used in the passages and chambers, although there is often some danger of a cave-in. The natural ventilation through the tunnels, by means of several surface openings, rendered the air fairly clean. In one of the mines a forced-draft fan from the surface provided air for some headings.

Briefly, the mining operations consist of drilling with a jackhammer, firing a charge of black powder, and loading the broken talc into the buggy. Because of the comparative softness of the talc, approximately an hours' time (on the average) is consumed in the drilling of the 1 to 6 holes daily.

The talc, which is blown out in large lumps, is loaded by muckers into the buggy and hauled to the surface. The talc rock is unloaded and placed in sheds to avoid wetting. No other operations are involved in mining. The talc is hauled to the mills, about 4 miles distant, by means of trucks.

Inasmuch as the mining procedures of the two companies studied adjoined one another and the operations involved in the mining of talc were identical, dust samples during drilling and mucking operations were taken in only one of them.

RESULTS OF DUST ANALYSES

The results of dust samples taken in the two talc mills and mines described above are shown in tables 2 and 3. In all, 19 samples were taken, giving counts which may be taken as the average of the particular activities involved. It will be seen from these tables that the packermen, sawyers, and drillers receive the highest exposure to dust, that is, 16 workers out of the 36 employed in both plants and mines. The packermen actually receive the greatest exposure, although in one

plant a low count was obtained because the packing operations had not been carried on steadily at the time the sample was taken. However, in view of the fact that the packing methods were identical in both plants, the average count of 1,672 million particles per cubic foot may be taken as a fair average.

TABLE 2. – *Occupational and dust analyses made in 2 talc mills*

Activity	Number of men employed	Number of dust samples taken	Millions of dust particles per cubic foot (average of all samples)
Sawyers (block cutting and pencil making)	10	5	[illegible]24
Crushermen	2		[illegible]
Packermen [2]	[illegible]	3	[1] 1,672
Pencil borers	4	2	[illegible]1
Foremen and helpers	[illegible]	1	[illegible]
Total	2[illegible]	11	

[1] Average of 2 samples in 1 plant. Third sample from other plant taken after short period of operation gave count of [illegible] million particles per cubic foot.
[2] Women employed at this occupation.

TABLE 3. – *Dust determinations made at a talc mine*

Activity	Number of men [1]	Number of samples	Average dust count
Drillers and helpers	2	3	855
Muckers	2	3	[illegible]62
Outside man (hoister)	1		----

[1] Total inside and outside workers, both mines, 1[illegible] men.

The crushermen were exposed to a lower count than was anticipated, inasmuch as the packing operations were carried on close by. The reason for this condition is perhaps due to the natural ventilation which existed near the crushers, since in both plants they were close to the unloading platform. It is probable that on certain days the counts might be much higher, almost of the same order as that of the packermen.

The sawyers showed a fairly high exposure to dust, the counts averaging 324 million particles per cubic foot. It is a curious fact that the newer mill showed higher counts than the older. This is undoubtedly due to the small quarters given to the activities. The pencil borers and packers, as might be expected, showed minimum counts. The average plant dustiness, exclusive of the packing operations, to which helpers and foremen were exposed, was 162 million particles per cubic foot.

The chief activities in the mine are drilling and mucking. As has been pointed out, however, drillers are exposed only about an hour daily to an average concentration of 855 million particles per cubic foot. After firing, the drillers assist the muckers and are exposed to

a fairly low count of 32 million particles per cubic foot. The reason for this low dust count in mucking is probably due to the large sizes of talc which are handled. Inasmuch as both drillers and muckers are practically exposed to identical concentrations for varying periods of time, the weighted average of their exposure may be taken as 135 million particles per cubic foot. This average is based upon 1 hour's drilling time and 7 hours of mucking, thus $\frac{1\times855+(7\times32)}{8}=135$ million particles per cubic foot.

MEDICAL OBSERVATIONS

Procedure.—It was possible to secure physical examinations of 66 talc workers and former talc workers, of which number 55 were males and 11 females. All were native American white. Thirty of the group were working in the talc mines or mills or had been working up to within a few months of the time of these observations; 8 of the 30 were females.

The general procedure followed in making the medical examinations was the same as that used in the recent anthracite study (6). Briefly, the examination of each individual consisted of a present medical, past medical, and occupational history (7), with a height and weight determination, inspection of the mouth and throat, measurement of the chest expansion, a functional exercise test, and a careful clinical and roentgenological examination (by fluoroscopy and skiagraphy) of the chest. Cognizance was taken only of gross impairments elsewhere in the body.

Fifty-eight [2] persons were given the examination as outlined. To these were added certain persons examined by the Georgia Department of Health which furnished the Public Health Service roentgenograms and other data. Those persons of this supplemental group on whom sufficient data were obtained are included in the analysis.

The 66 talc workers were divided into 3 groups according to dust exposure, as follows:

(*a*) 33 mill workers, exposed to 300 or more million particles of dust per cubic foot.

(*b*) 13 miners, exposed to an average of 135 million particles per cubic foot.

(*c*) 20 additional workers,[3] exposed to an average of 17 million particles per cubic foot.

In those instances in which the individual had worked in both mill and mine, the job which contributed to more than two-thirds of his total weighted exposure was chosen for the final placing of the case.

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[2] One of this number who had worked less than a year in the talc mines has been excluded from the analysis because of several year's exposure in rock tunneling elsewhere.

[3] A few cases who had worked only a few days or months at a higher concentration were also placed in this group.

The age distribution of these workers showed that 26 (39 percent) were less than 30 years of age; 30 (45 percent) were between the ages of 30 and 49, and 10 (16 percent) were 50 years of age or older.

With reference to the length of service, regardless of exposure, 29 (44 percent) had worked less than 5 years; 18 (27 percent), 5 to 9 years; 13 (20 percent), 10 to 14 years; and 6 (9 percent), 15 or more years. Only two of the latter had worked 20 or more years in the trade. It is obvious, therefore, that a comparatively youthful group with short periods of exposure to dust is being dealt with.

CLINICO-ROENTGENOGRAPHIC FINDINGS

On physical examination, the talc mill workers were found to be more undersized and underweight than workers employed in other more arduous dusty occupations. This observation is similar to that noted in another Southern industry (cotton textile) (8). For the most part, the 42 men who were employed or had been employed in the mills were more under weight than the 13 miners who were examined. Table 4 gives the deviation in weight from the life insurance and actuarial standard of normal.

TABLE 4.—*Deviations in weight as found in 55 male talc workers*

Weight	Talc workers	
	Number	Percent
30 pounds and more over	1	1.8
10-29 pounds over	3	5.5
9 pounds over to 9 pounds under	23	41.8
10-29 pounds under	26	47.3
30 pounds and more under	2	3.6

It may be noted from this table that approximately one-half of the workers examined were more than 10 pounds under weight.

In table 5 are shown the number of cases having pneumoconiosis in the various major activities associated with the talc industry at Chatsworth, Ga.

TABLE 5.—*Number of workers in 3 major activities having pneumoconiosis*

Activity	Number of men exposed	Stage of pneumoconiosis		
		I	II	III
Sawyers, packers, and crushermen	33	8	5	3
Miners	13	6		
Others [1]	20			

[1] Mill workers.

This table shows that 16, or approximately half, of the mill workers in the higher dust groups were diagnosed as having pneumoconiosis. Of this group there were eight cases showing definite symptoms of the disease, such as dyspnoea, cough, chest pain, râles, and other abnormal chest findings, clubbing of the fingers and roentgenologic manifestations of nodular or nodular conglomerate types of fibrosis, and more or less diaphragmatic fixation. Considering all clinical and roentgenologic findings together, these eight cases were diagnosed pneumoconiosis II and III. Changes of this degree were noted in 3 mill workers with 5 to 9 years' exposure; in 4 of those with 10 to 14 years' exposure; and in 1 with more than 15 years' exposure.

The miners showed no evidence of advanced pneumoconiosis, although 6 of the 13 men examined had pneumoconiosis I. In the lower dust group all were diagnosed as essentially negative.

Five persons in the group exposed to more than 300 million particles per cubic foot were diagnosed pneumoconiosis plus tuberculosis. Only one additional case had findings which would make a diagnosis of tuberculosis tenable. This diagnosis was made on a sawyer whose length of exposure was less than 3 years.

The clinical findings of the mill workers in the advanced stages of pneumoconiosis (II and III) referred to above are best presented by abstracts of 4 of these cases illustrated by the accompanying plates (plates I and II).

CASE NO. 27. NATIVE AMERICAN WHITE MALE, AGE 34 YEARS

Occupational history—chronologically from the time he began working at 20 years of age.—Packerman (talc mill), 1 year; farmer, 2 years; trammer (talc mine), 3 years; talc miner, 2 years; crayon sawyer (talc mill), 6 years. (Rated as 9 years' milling.)

Past medical history.—Influenza, 1927.

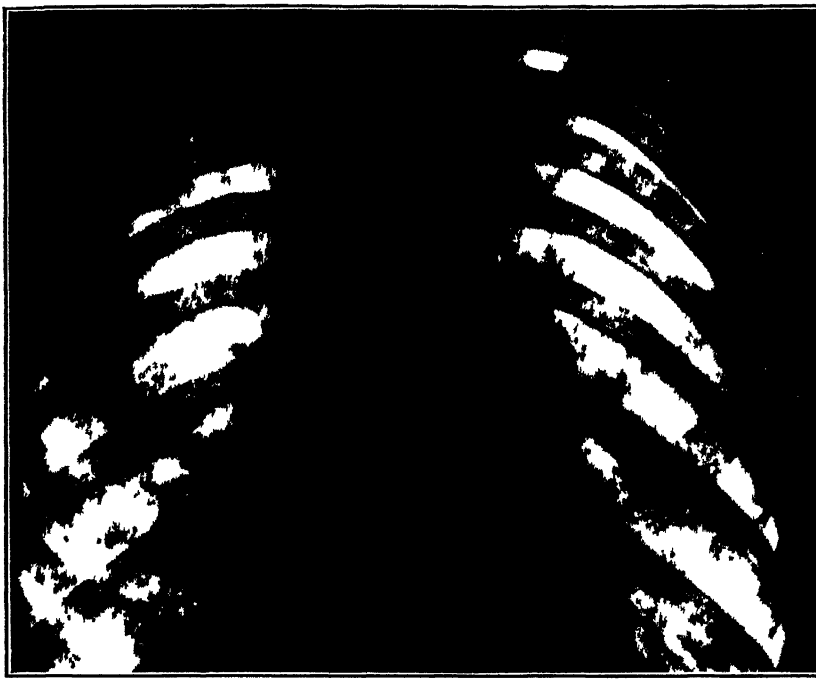
Complaints.—(1) Short-winded; (2) fatigues easily.

Physical examination.—General appearance, fair; asthenic development. Height, 69 inches; weight, 143 pounds. (Greatest weight, 160 lbs., 5 years previously.) Chest asthenic in type, with moderately prominent supra- and infra-clavicular fossae. Chest expansion, 2½ inches. Slight clubbing of the fingers. Fremitus increased over both upper lobes. Resonance impaired from sixth thoracic spine and third rib up on the right. Breath sounds are broncho-vesicular over the area of impaired resonance, and post-tussic crepitant râles are heard over this area. B. P., 120/78. Fair cardiac response to exercise. Respiratory rate before, immediately after, and 2 minutes after exercise, 16, 24, 24.

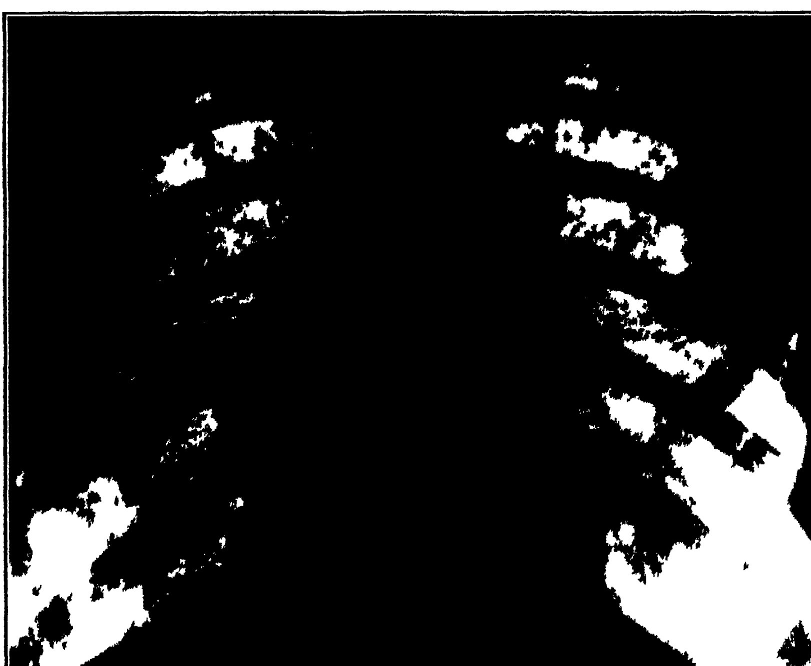
Fluoroscopy.—Diaphragm excursion is limited moderately (2+). Hilar shadows are increased moderately (2+) in density and slightly (1+) in size. Lung fields showed diffuse second degree grainy, 1st degree nodular shadows which were tending to coalesce.

X-ray (see plate I) shows slight veiling of the right apex and the diffuse, small, nodular shadows and increase in the hilar shadows. The linear markings are almost obliterated.

Diagnosis.—Pneumoconiosis II plus pulmonary infection.



CASE NO 27.



CASE NO. 13.

CASE No 10

CASE No 50

CASE NO. 13. NATIVE AMERICAN WHITE MALE, AGE 31 YEARS

Occupational history—chronologically from the time he began working at 12 years of age.—Farmer, 1 year; laborer (lumber saw mill), 5 years; drillman (talc mine), 5 years; talc sawyer (mill), 9 years; idle, 2 years; and laborer, 3 months (CWA).

Past medical history.—Influenza, 1918 (3 weeks), complicated with pleurisy, right chest.

Complaints.—(1) Unable to work because of shortness of breath and distress in chest; (2) pain in right chest aggravated by breathing.

Physical examination.—Height, 70 inches; weight, 158 pounds. Comparatively healthy appearing male of medium-slender development. Mouth breather. B. P., 118/80. Pulse rate before, immediately after, and 2 minutes after exercise, 80, 112, 84. Chest, prominent supra- and infra-clavicular fossae; expansion, 3 inches. Fremitus moderately decreased in right base posteriorly, also decreased slightly over the remainder of the chest. Resonance, impaired in both right and left uppers and right base, posterior. Breath sounds were generally distant, and particularly at right base. Friction rub right base and axilla.

Fluoroscopy.—Revealed apparently clear apices except a conglomerate shadow (about 2.5 cm in diameter) behind right mid-clavicle; slight limitation in excursion of the diaphragm on both sides; hilar shadows moderately increased in density and size; and a diffuse grainy appearance was noted over the entirety of the lung fields, with slight emphysema at bases. The heart appeared normal.

X-ray and comments (see plate I).—It will be noted that the predominant appearance of the fibrosis is grainy and nodular, yet a suggestion of linear appearance still remains. The conglomerate in the right apex probably represents an early infiltrate (Ghon's focus). This finding, with other clinical findings pointing to pathology in the right side of the chest, suggests that the infective element plays a prominent role in the clinical picture of this case

Diagnosis.—Pneumoconiosis II (with dormant tuberculous infection).

CASE NO. 10. NATIVE AMERICAN WHITE MALE, AGE 33 YEARS

Occupational history.—Chronologically from beginning to work at the age of 8 years: Farmer, 9 years; crayon sawyer (talc mill), 5 years; talc miner, 8 years; farmer, 3 years.

Past medical history.—Influenza, 1921 (1 week); pleurisy, 1934 (bedridden 1 week).

Complaints.—(1) Shortness of breath; (2) pain in left lumbar region and lower left chest, posterior; occasional supra-clavicular pain on left; (3) productive a. m. cough (muco-purulent); and (4) progressive loss of weight for last 3 years.

Physical examination.—Chronically ill, pale, slightly cyanotic white male of medium development. Height, 63 inches; weight, 125 pounds (usual weight 150 lbs.). Moderate (2+) clubbing of the fingers and slight cyanosis of the nails. Chest was asthenic in type; expansion, 2¼ inches. Moderately prominent supra- and infra-clavicular fossae. Tactile fremitus increased over left upper lobe. Moderate impairment of resonance over left lung from level of fifth thoracic spine and second rib up; slight impairment over right apex. Broncho-vesicular breath sounds and crepitant (persistent post-tussic) rales over left upper lobe. Heart apparently negative. Pulse rate before, immediately after, and 2 minutes after functional exercise test, 104, 128, 96. Respiratory rate at same intervals, 18, 26, 26. B. P., 138/72.

Fluoroscopy.—Conglomerate and coalescing nodules in upper ⅔ of each lung field. Moderate emphysema at bases. Most dense involvment in subapical regions. Moderate (2+) limitation in the excursion of the diaphragm. Slight (1+) mediastinal distortion.

X-ray (see plate II).—Slight irregularity of the diaphragm is noted. The hilar shadows are indefinite as they merge with shadows of involved parenchymal tissue. Massive coalescing—conglomerate shadows most dense on the left are seen in both infra-clavicular regions.

Comment.—This man's incapacity for work is suggested by his returning to farming during the last 3 years. One antiforminized specimen of sputum was negative for acid-fast micro-organisms. The marked constitutional changes with the symptoms and X-ray findings on the case suggest that pulmonary infection (clinical tuberculosis) is an important contributor to his present condition.

Diagnosis.—Pneumoconiosis III with pulmonary infection.

CASE NO. 30. WHITE MALE, AGE 60 YEARS

Occupational history.—Chronologically from beginning to work at age of 16: Farmer, 17 years; logger (lumber saw-mill), 6 years; railroad laborer, 10 years; talc miller (crusherman), 11 years.

Past medical history.—Influenza, 1917 (10 days); pneumonia, 1910; subject to frequent colds.

Complaints.—(1) Productive cough; (2) shortness of breath.

Physical examination.—Comparatively healthy appearing male; height, 66 inches; weight, 150 pounds. Moderate dyspnoea. Not subjected to functional exercise test because of cardiac condition. Moderate (2+) clubbing of the fingers. B. P., 132/78. Pulse, about 56, irregular in rate, rhythm, and force, with pulse deficit. Chest moderately emphysematous; expansion, $1\frac{1}{2}$ inches. Fremitus increased over entire right and upper portion of left lung. Moderate impairment (dull) of resonance from the angle of scapula and third rib up on both sides with hyper-resonance over the lower anteriors. Breath sounds were harsh. Persistent (post-tussic) crepitant and subcrepitant rales in both interscapular areas.

Fluoroscopy.—Right diaphragm was peaked with moderate (2+) limitation in the excursion of the diaphragm on both sides. A large conglomerate shadow was noted in the right infra-clavicular region and a smaller, less dense shadow of similar nature in upper left lung field extending from the upper pole of the hilus to the periphery; slight mediastinal distortion; both apices were comparatively clear; moderate emphysema at bases.

X-ray (see plate II).—Note irregularity of the diaphragm on the right, marked increase in hilar shadow. Areas of increased density continuous with the hilar shadow extending to the right and left in upper lung fields. Emphysema especially marked at both bases.

Comment.—In addition to extensive pulmonary changes, it is interesting to note the presence of cardiac disease.

Diagnosis.—Pnemoconiosis III with pulmonary infection.

It was mentioned earlier that only 30 of the 66 persons examined were working or had been working recently in the plants. Among the remainder were 9 who had been separated from the exposure for 3 or more years. These 9 men had pneumoconiosis, 4 of whom were in the advanced stages. Three of this same group had not worked in talc or any other dusty trade since 1920; 2 of the men in this latter group were in the advanced stages of the disease. The fact that these 9 cases still showed pneumoconiosis, particularly the last-mentioned cases where 13 to 14 years had lapsed since the cessation of exposure, suggests that the pulmonic changes are permanent.

COMPARISON OF THE FINDINGS WITH THOSE OF A PREVIOUS TALC STUDY

The previous talc study (1) revealed similar findings as regards cases designated "pneumoconiosis I." With regard to the earlier findings, it is necessary to point out that, with one exception, this was the maximum degree of severity observed. This exceptional case was designated "pneumoconiosis II" and was diagnosed in a worker who had been employed in the talc industry for more than 40 years at a dust concentration of approximately 50 million particles per cubic foot. In the present instance, however, about a third of the workers having pneumoconiosis are in the advanced stages and have been exposed to over 300 million particles per cubic foot, and in no case had a worker been exposed for more than 20 years.

TUBERCULOSIS MORTALITY

Since one of the reasons for undertaking the investigation of the conditions in the Georgia talc plants was to ascertain a possible contributory cause to the high tuberculosis morbidity and mortality rates in the county where the plants are located, a brief review of certain available data on this subject is in order.

All the counties of northern Georgia have a comparatively low percentage of Negroes. If 7 other northern Georgia counties[4] are considered for comparison, in addition to Murray County, the collective population of these counties for all classes is found to be 103,281 (United States census, 1930). Of this number, 6,152 (5.9 percent) are Negroes. The average tuberculosis mortality rate (all forms, chiefly pulmonary) for this group of counties in 1931 and 1932 was computed as 76.8 and 77.9 per 100,000, respectively. On the other hand, in the county where the talc observations were made, the rates[5] for these years are 53.2 and 146.7, respectively, even though there is a smaller proportion of Negroes (2.5 percent).

The sudden increase in the tuberculosis death rate for 1932 occurs in other counties for the same year. What is more important and to the point is that probably not more than 100 persons in the county have been exposed to talc dust during the period that the mills have been in operation. It is apparent from the medical findings considered in the light of the dust exposure, that a comparatively small proportion of the workers have been exposed to dangerous amounts of dust over a period sufficiently long to produce disabling pulmonary changes or predispose to tuberculosis. It is not felt, therefore, that the increase in the tuberculosis death rate for the county in 1932 can be explained by exposure to talc dust.

[4] Catoosa, Gordon, Gilmer, Fannin, Pickens, Walker, and Whitfield Counties.
[5] Biennial Report, Department of Public Health, Georgia State Board of Health, Atlanta, 1931-32.

SUMMARY

Two talc mills and mines in northern Georgia were studied in an effort to determine whether there is a connection between talc dust exposure and the high tuberculosis mortality rate reported in the county in which the industry is located. Georgia talc is used chiefly for manufacturing marking pencils for the steel and building construction trades. Such talc as is milled is incidental, and is carried on in order to dispose economically of the waste incurred in cutting the pencils. As in the case of tremolite talc, which has been studied by the Public Health Service (1), Georgia talc contains only traces of free silica in the form of quartz. The amount of tremolite (about 10 percent) found by petrographic analysis averaged one-fourth the amount reported in the previous study.

In all, 32 men and 4 women were employed in the mills and mines at the time of the study. The sanitary facilities were found to be comparatively poor. Nineteen dust samples (using the impinger and the Public Health Service technique of counting) were obtained in order to evaluate the dust concentrations associated with the various occupations. The packerman showed the highest dust exposure, averaging 1,672 million particles per cubic foot. Next in order were the pencil cutters, with an average exposure of 324 million, and these were followed by the crushermen, with an exposure of 86 million particles per cubic foot. The pencil packers, comprising female workers only, were exposed to 17.1 million particles per cubic foot. In the mines, the drillers had a maximum exposure of 855 million, while muckers averaged 32 million particles per cubic foot. Inasmuch, however, as both drillers and muckers interchanged their duties, the weighted average exposure was found to be 135 million particles per cubic foot. In comparison with the study referred to above, the dust counts in the mills were much higher in the present instance, which may be attributed partly to the type of operations carried on and partly to the lack of ventilation facilities to remove the dust at the points of origin.

With regard to particle size of dust present in the air, two samples taken with an Owens' jet and measured under 1,000 diameters, gave a median size of 0.8 micron.

Physical and roentgenologic examinations were made of 66 men and women who were exposed or had been exposed to talc dust. In the higher dust groups comprising 33 men, 8 were found to have pneumoconiosis I and 8 to have pneumoconiosis II or III. Six of the thirteen miners examined were diagnosed as having pneumoconiosis I; no advanced stages of the disease were found in this group. In the group exposed to low concentrations of dust, no pneumoconiosis was found.

Five cases having pneumoconiosis were also diagnosed as having tuberculosis. One other case was found to have tuberculosis not complicated by pneumoconiosis. On the basis of medical findings, together with other data obtained from the 1931–32 biennial report of the Georgia State Department of Health, the high tuberculosis mortality rate in the county could not be attributed to the talc industry. In comparison with the previous study, Georgia talc appears to be more injurious than tremolite talc.

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BIOLOGICAL METHODS OF SEWAGE TREATMENT IDENTIFIED WITH WATER SOFTENING

Recent studies, by Public Health Service workers, of the adsorption of organic matter from sewage by the so-called "activated" sludges have led to the definite identification of the adsorbent principle in activated sludge as a base-exchanging substance chemically identical with the zeolites of water purification. The process of removing organic matter from sewage by the biological slimes or activated sludges, therefore, becomes basically the same as the corresponding process of removing hardness and other objectionable constituents in a widely-used process of water purification. Detailed information on this new concept regarding an old problem will be contained in a series of papers by Public Health Service investigators soon to be published. In these papers the earlier theories of sewage clarification will be reviewed and the conclusion reached that the adsorbent principle is related not to the bacteria themselves, but to the gelatinous matrix or sludge in which they are embedded. It will next be shown by chemical analysis that the inorganic portion of the gelat-

inous matrix is definitely a zeolite. In continuation of the same series of papers, the behavior of activated sludge will be shown to conform rigidly to the action of a zeolite. The sterilized sludge, for example, can be regenerated by sodium chloride in exactly the same manner as the commercial zeolites. Under natural conditions, however, the regeneration of the sludge is technically called a "reactivation", with the bacteria as the active agents instead of sodium chloride. Natural sludge is, therefore, termed a "bio-zeolite." In conclusion, the clotting enzyme, or sewage colloid of the earlier chemists, will be identified with the sludge zeolite.

MILK-SANITATION RATINGS OF CITIES

Cities for Which Milk-Sanitation Ratings of 90 Percent or More Were Reported by the State Milk-Sanitation Authorities During the Period January 1, 1933, to December 31, 1934

The accompanying table gives the first annual revision of the list of American municipalities for which milk-sanitation ratings of 90 percent or more have been reported by their respective State milk-sanitation authorities, and includes those reported from January 1, 1933, to December 31, 1934. Lists previously published have now lapsed and should be discarded.

The primary reason for announcing such ratings from time to time is to encourage the municipalities of the United States to attain and maintain a high level of excellence in the public health control of milk supplies. Another reason is to furnish the traveling public with some means of knowing the cities in which milk sanitation is properly done. It is emphasized, however, that the Public Health Service does not intend to imply that cities not on the list are necessarily doing poor milk-control work. Some cities which are doing excellent milk-control work are not included, because arrangements have not yet been made for the determination of their ratings by the State milk-control authority. In other cases the ratings which have been determined by the State are now more than 2 years old and have therefore lapsed.

The rules under which a municipality is included in this list are as follows:

(1) All ratings must have been determined by the State milk-control authority in accordance with the Public Health Service rating method, based upon the Public Health Service Milk Ordinance and Code.

(2) No city will be included in the list unless both its pasteurized-milk and its raw-milk ratings are 90 percent or more; provided, that cities in which only raw milk is sold will be included if the raw-milk ratings are 90 percent or more.

(3) The rating used will be the latest rating submitted to the Public Health Service, but no rating will be used which is more than 2 years old.

(4) Additional supplementary lists will hereafter be published quarterly, and complete revisions of the entire list semiannually.

(5) Occasional surprise checks will be made of the rating methods used by the State, and discounts will be applied if State ratings are found to be more than 5 percent too high.

(6) Ratings will be accepted for any city irrespective of the type of milk ordinance in force, provided that the ratings have been made in accordance with paragraph (1) above.

Cities are urgently advised to bring their ordinances up to date at least every 5 years, since ratings will hereafter be made on the basis of later editions if those adopted locally are more than 5 years old. It is also urged that cities now on the list do not permit their ratings to lapse, as ratings more than 2 years old cannot be used.

Cities which are not now on the list should improve their milk supplies as much as possible and then request the State milk-control authority to determine their ratings. Where the Public Health Service Milk Ordinance has not as yet been adopted, thoughtful consideration should be given to the advisability of its adoption, for the reason that the standard rating method is based upon the grade A requirements of the Public Health Service Milk Ordinance, and it is obviously easier to satisfy these requirements if they are included in the local legislation. Copies of the Public Health Service Milk Ordinance and Code are available upon request.

State milk-control authorities which are not now equipped to determine municipal milk-sanitation ratings are urged to equip themselves as soon as possible in fairness to their cities. The personnel required is very small, as in most States one milk specialist will be sufficient for the rating work. The Public Health Service will, upon request from the State milk-control authority, furnish assistance in standardizing the rating work.

Cities which are enforcing the Public Health Service Milk Ordinance and which have nevertheless failed to achieve ratings of 90 percent or more, should determine whether their low ratings resulted from failure to enforce the ordinance strictly or from failure to bring their ordinance up to date.

The ratings on which the accompanying table is based apply only to market milk. Family-cow milk is not included; and consumers should, therefore, not infer that the milk from neighborhood cows in such cities is of a high grade.

Cities having ratings of 90 percent or more according to last rating received during the period Jan. 1, 1933, to Dec. 31, 1934

City	Percentage of milk pasteurized	Date of rating
INDIANA (1 CITY)		
Frankfort	100	Mar. 11, 1933
KANSAS (3 CITIES)		
Horton	0	Dec. 4, 1934
Lawrence	34	Apr. 1934
Topeka	51	Nov. 28, 1934
KENTUCKY (3 CITIES)		
Bowling Green	31	Dec. 5, 1934
Henderson	27	May 1934
Louisville	97	May 18, 1934
MINNESOTA (1 CITY)		
Winona	100	Sept. 14, 1934
MISSISSIPPI (17 CITIES)		
Brookhaven	0	May 18, 1933
Cleveland	41	July 20, 1933
Columbus	39	July 12, 1933
Durant	0	May 22, 1933
Greenville	13	May 31, 1933
Greenwood	23	July 14, 1933
Hollandale	0	June 1, 1933
Indianola	0	June 2, 1933
Jackson	22	Aug. 11, 1933
McComb	0	June 21, 1933
Meridian	22	May 4, 1933
Natchez	16	May 17, 1933
Ocean Springs	0	July 7, 1933
Picayune	76	June 8, 1933
Ruleville	0	June 2, 1933
Vicksburg	35	June 28, 1933
Yazoo City	0	May 24, 1933
MISSOURI (2 CITIES)		
Ash Grove	0	Aug. 24, 1934
Jefferson City	41	Dec. 15, 1934
NEW MEXICO (3 CITIES)		
Clayton	0	June 3, 1933
Deming	0	Apr. 27, 1934
Las Cruces	20	Feb. 27, 1934
NORTH CAROLINA (29 CITIES)		
Angier	0	Sept. 1, 1934
Apex	0	Sept. 28, 1933
Beaufort	0	July 15, 1933
Buies Creek	0	Sept. 4, 1934
Charlotte	19	Dec. 15, 1934
Clinton	0	Oct. 25, 1934
Coats	0	Sept. 4, 1934
Dunn	0	Do.
Durham	83	Dec. 11, 1934
Elkin	0	Sept. 12, 1934
Erwin	0	Oct. 10, 1933
NORTH CAROLINA (29 CITIES)—Continued		
Greensboro	62	Nov. 24, 1934
Hamlet	0	Aug. 28, 1934
Hendersonville	35	Oct. 3, 1933
High Point	60	Oct. 21, 1933
Hope Mills	0	Sept. 6, 1934
Lenoir	0	Nov. 20, 1934
Lillington	0	Sept. 4, 1934
Lumberton	0	Sept. 11, 1934
Manteo	0	Oct. 23, 1934
Monroe	0	Oct. 24, 1934
Mount Airy	0	Sept. 12, 1934
New Bern	0	Oct. 11, 1934
Pinehurst	0	Dec. 15, 1934
Rockingham	0	Aug. 29, 1934
Rocky Mount	20	Sept. 12, 1934
Southern Pines	0	Aug. 31, 1934
Williamston	0	Dec. 12, 1934
Winston-Salem	46	Nov. 11, 1934
OKLAHOMA (3 CITIES)		
Bartlesville	15	Mar. 6, 1934
Blackwell	46	Sept. 5, 1934
Tulsa	74	Feb. 16, 1934
OREGON (1 CITY)		
Portland	76	Oct. 1934
SOUTH CAROLINA (1 CITY)		
Charleston	100	Apr. 1934
TENNESSEE (2 CITIES)		
Dyersburg	0	June 1, 1933
Memphis	73	July 1933
TEXAS (17 CITIES)		
Abilene	70	Oct. 17, 1934
Amarillo	63	May 30, 1934
Brenham	0	Apr. 20, 1934
Canyon	0	May 29, 1934
Colorado	0	Sept. 6, 1934
Corsicana	0	Feb. 22, 1934
Dallas	73	May 1934
Denton	58	Sept. 22, 1934
El Paso	70	Aug. 21, 1934
Jacksonville	0	May 1934
Laredo	34	Dec. 12, 1934
Livingston	0	Oct. 1934
Lubbock	32	Dec. 14, 1934
San Antonio	56	July 1934
Sherman	21	Dec. 21, 1934
Texarkana	20	May 1934
Tyler	50	Mar. 1934
WASHINGTON (2 CITIES)		
Camas	10	Sept. 1934
Vancouver	24	Do.

The inclusion of a city in this list means that the pasteurized milk sold in the city, if any, is of such a degree of excellence that the weighted average of the percentages of compliance with the various items of sanitation required for grade A pasteurized milk is 90 percent or more, and that, similarly, the raw milk sold in the city is of such a

degree of excellence that the weighted average of the percentages of compliance with the various items of sanitation required for grade A raw milk is 90 percent or more. However, high-grade pasteurized milk is safer than high-grade raw milk, because of the added protection of pasteurization. To secure this added protection, friendly customers of high-grade raw-milk dairies need not discontinue their patronage, but may pasteurize the milk at home in the following simple manner: Place the milk in an aluminum vessel on a hot flame and heat to 155° F., stirring constantly; then immediately set the vessel in cold water and continue stirring until cool.

BIOLOGICAL PRODUCTS

ESTABLISHMENTS LICENSED FOR THE PROPAGATION AND SALE OF VIRUSES, SERUMS, TOXINS, AND ANALOGOUS PRODUCTS

There is presented herewith a list of the establishments holding licenses issued by the Treasury Department in accordance with the act of Congress approved July 1, 1902, entitled "An act to regulate the sale of viruses, serums, toxins, and analogous products in the District of Columbia, to regulate interstate traffic in said articles, and for other purposes."

The licenses granted to these establishments for the products mentioned do not imply an endorsement of the claims made by the manufacturers for their respective preparations. The granting of a license means that inspection of the establishment concerned and laboratory examinations of samples of its products are made regularly to insure the observance of safe methods of manufacture, to ascertain freedom from contamination, and to determine the potency, or safety, or both, of botulinus antitoxin, diphtheria antitoxin, perfringens antitoxin, scarlet fever streptococcus antitoxin, staphylococcus antitoxin, tetanus antitoxin, vibrion septique antitoxin, antidysenteric serum, antimeningococcic serum, antipneumococcic serum, bacterial vaccines made from typhoid bacillus, paratyphoid bacillus A, and paratyphoid bacillus B, diphtheria toxin-antitoxin mixture, diphtheria toxoid, diphtheria toxin for Schick test, scarlet fever streptococcus toxin for Dick test, scarlet fever streptococcus toxin for immunization, and the arsphenamines, the only products for which potency standards or tests have been established.

The enumeration of the products is as follows: Serums are placed first, the antitoxins, being more important, heading the list. The other products are arranged generally in the order of their origin. The items in each class are arranged alphabetically.

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Establishments Licensed and Products for Which Licenses Have Been Issued

AMERICAN ESTABLISHMENTS

Parke, Davis & Co., Detroit, Mich.—License no. 1:

Diphtheria antitoxin; meningococcus antitoxin; perfringens antitoxin; scarlet fever streptococcus antitoxin; tetanus antitoxin; vibrion septique antitoxin; antianthrax serum; antidysenteric serum; antigonoccic serum; anti-influenza bacillus serum; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum; hemostatic serum (Lapenta); normal horse serum; thyroidectomized horse serum; smallpox vaccine; rabies vaccine (Cumming); tuberculin old; tuberculin T. R.; tuberlin B. E.; tuberculin B. F.; bacterial vaccines made from acne bacillus, acne diplococcus, Brucella melitensis, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, prodigiosus bacillus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus and typhoid bacillus, diphtheria toxin antitoxin mixture; diphtheria toxoid-antitoxin mixture; diphtheria toxoid, diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; animal epidermal extracts; animal food extracts; vegetable food extracts; pollen extracts; modified bacterial derivitives made from colon bacillus, gonococcus, paratyphoid bacillus A, paratyphoid bacillus B, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; bacterial antigens made from colon bacillus, gonococcus, pertussis bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, and streptococcus.

Mulford Biological Laboratories, Sharp & Dohme, Broad and Wallace Streets, Philadelphia, Pa.—License no. 2:

Botulinus antitoxin; diphtheria antitoxin; erysipelas streptococcus antitoxin; B. histolyticus antitoxin; B. odematiens antitoxin; perfringens antitoxin; scarlet fever streptococcus antitoxin; B. sordelli antitoxin; staphylococcus antitoxin; tetanus antitoxin; vibrion septique antitoxin; antianthrax serum; antidysenteric serum; antierysipeloid serum; antigonococcic serum; anti-influenza bacillus serum; antimelitensis serum; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum, antitularemic serum, antivenin (Nearctic crotalidae); antivenin Bothropic; antivenin (crotalus terrificus); normal horse serum; smallpox vaccine; rabies vaccine (Pasteur); rabies vaccine (killed virus); tuberculin old; tuberculin T. R.; tuberculin B. E.; tuberculin B. F.; bacterial vaccines made from acne bacillus, cholera vibrio, colon bacillus, dysentery bacillus, Friedländer, bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, micrococcus melitensis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, plague bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, bacterium tularense, and typhoid bacillus; sensitized bacterial vaccines made from acne bacillus, cholera vibrio, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; staphylococcus toxoid; tetanus toxoid; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; pollen extracts; animal epidermal extracts; animal food extracts; vegetable food extracts; poison ivy extract; poison oak extract; pneumococcus antibody solution; bacterial antigen made from streptococci; snake venom solution.

The Cutter Laboratory, Berkeley, Calif.—License no. 8:

Diphtheria antitoxin; B. odematiens antitoxin; perfringens antitoxin; scarlet fever streptococcus antitoxin; B. sordelli antitoxin; tetanus antitoxin; vibrion septique antitoxin; antianthrax serum; antistreptococcic serum; normal horse serum; smallpox vaccine; rabies vaccine (Pasteur); rabies vaccine (killed virus); tuberculin old; tuberculin B. F.; bacterial vaccines made from acne bacillus, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; bacterial antigens made from colon bacillus, staphylococcus aureus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test; pollen extracts; poison ivy extract; poison oak extract.

Bureau of Laboratories, Department of Health, Foot East Sixteenth Street, New York City.—License no. 14:

Smallpox vaccine.

Lederle Laboratories (Inc.), Pearl River, N. Y.—License no. 17:

Diphtheria antitoxin; erysipelas streptococcus antitoxin; B. histolyticus antitoxin; B. odematiens antitoxin; perfringens antitoxin; B. sordelli antitoxin; tetanus antitoxin; vibrion septique antitoxin; antianthrax serum; antidysenteric serum; antigonococcic serum; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum; measles immune serum; immune globulin (human); normal horse serum; smallpox vaccine; rabies vaccine (killed virus); tuberculin old; tuberculin B. E.; tuberculin B. F.; bacterial vaccines made from acne bacillus, Brucella melitensis, cholera vibrio, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, plague bacillus,

pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, staphylococcus citreus, streptococcus, and typhoid bacillus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; staphylococcus toxoid; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; pollen extracts; poison ivy extract; poison oak extract; animal epidermal extracts; animal food extracts; vegetable food extracts; animal oil extracts; vegetable oil extracts; oidiomycon extract; trichophyton extract; snake venom solution.

Bacterio-Therapeutic Laboratory, Asheville, N. C.—License no. 23:

Watery extract of tubercle bacilli (von Ruck), modified tubercle bacillus derivative (von Ruck).

G. H. Sherman, M. D., Inc., 11600 East Jefferson Avenue, Detroit, Mich.—License no. 30:

Bacterial vaccines made from acne bacillus, Brucella melitensis, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, nonvirulent tubercle bacillus, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; pollen extracts; bacterial antigens made from colon bacillus, gonococcus, micrococcus catarrhalis, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, and streptococcus.

The Abbott Laboratories, Fourteenth Street and C.-W. Interurban Railroad Tracks, North Chicago, Ill.—License no. 43:

Bacterial vaccines made from acne bacillus, Brucella melitensis, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, micrococcus tetragenus, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; bacterial antigens made from acne bacillus, colon bacillus, Friedländer bacillus, gonococcus, micrococcus catarrhalis, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus; pollen extracts; animal epidermal extracts; animal food extracts; vegetable food extracts.

The Upjohn Co., Kalamazoo, Mich.—License no. 51:

Bacterial vaccines made from colon bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; bacterial antigen made from staphylococcus aureus; pollen extracts.

E. R. Squibb & Sons' Research and Biological Laboratories, New Brunswick, N. J.—License no. 52:

Diphtheria antitoxin, erysipelas streptococcus antitoxin, perfringens antitoxin, scarlet fever streptococcus antitoxin, tetanus antitoxin; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum; immune globulin (human); normal horse serum; smallpox vaccine; rabies vaccine (Pasteur); rabies vaccine (killed virus); bacterial vaccines made from acne bacillus, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, staphylococcus citreus, streptococcus, and typhoid bacillus; bacterial antigen made from staphylococcus aureus; leucocytic extract from the horse; diphtheria toxin-antitoxin mixture; diphtheria toxoid; staphylococcus toxoid; tetanus toxoid; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; pollen extracts; poison-ivy extract, poison-oak extract, arsphenamine, neoarsphenamine, sulpharsphenamine.

Eli Lilly & Co., Indianapolis, Ind.—License no. 56:

Diphtheria antitoxin; erysipelas streptococcus antitoxin; perfringens antitoxin; tetanus antitoxin; vibrion septique antitoxin; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum; normal horse serum; hemostatic serum (Lilly); heterophile antibody; smallpox vaccine; rabies vaccine (Harris); tuberculin old; bacterial vaccines made from acne bacillus, cholera vibrio, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, plague bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; bacterial vaccine made from partially autolized pneumococci; diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test; bacterial antigens made from acne bacillus, colon bacillus, gonococcus, pneumococcus, staphylococcus albus, staphylococcus aureus, and streptococcus.

Gilliland Laboratories, Marietta, Pa.—License no. 63:

Diphtheria antitoxin; scarlet fever streptococcus antitoxin; tetanus antitoxin; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum; normal horse serum; smallpox vaccine; rabies vaccine (Pasteur); rabies vaccine (killed virus); tuberculin old; tuberculin B. E.; tuberculin, B. F.; bacterial vaccines made from acne bacillus, gonococcus, influenza bacillus, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization.

Antitoxin and Vaccine Laboratory, Department of Public Health, Commonwealth of Massachusetts, 375 South Street, Jamaica Plain, Boston 30, Mass.—License no. 64:

Diphtheria antitoxin; scarlet fever streptococcus antitoxin; antimeningococcic serum; antipneumococcic serum; smallpox vaccine; tuberculin old; bacterial vaccines made from paratyphoid bacillus A, paratyphoid bacillus B, and typhoid bacillus; diphtheria toxin-antitoxin mixture; diphtheria toxoid, diphtheria toxin for Schick test.

United States Standard Products Co., Woodworth, Wis.—License no. 65:
Diphtheria antitoxin; erysipelas streptococcus antitoxin; perfringens antitoxin; tetanus antitoxin; vibrion septique antitoxin; antimeningococcic serum; normal horse serum; smallpox vaccine; rabies vaccine (killed virus); bacterial vaccines made from acne bacillus, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; bacterial antigens made from staphylococcus albus, staphylococcus aureus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; tetanus toxoid; diphtheria toxin for Schick test; pollen extracts.

D. L. Harris Laboratories, Metropolitan Building, St. Louis, Mo.—License no. 66:
Rabies vaccine (Harris).

The Arlington Chemical Co., Yonkers, N. Y.—License no. 67:
Bacterial vaccines made from colon bacillus, micrococcus catarrhalis, micrococcus tetragenus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, staphylococcus citreus, and streptococcus; pollen extracts; animal epidermal extracts; animal food extracts; vegetable food extracts.

Dermatological Research Laboratories, 1720 Lombard Street, Philadelphia, Pa.—License no. 68:
Arsphenamine; silver arsphenamine; neoarsphenamine; sulpharsphenamine; bismuth arsphenamine sulphonate; neosilver arsphenamine.

The Winthrop Chemical Co., Inc., 33 Riverside Avenue, Rensselaer, N. Y.—License no. 69:
Arsphenamine; arsphenamine diglucoside; neoarsphenamine; sodium arsphenamine; silver arsphenamine; neosilver arsphenamine; sulpharsphenamine.

Diarsenol Co. (Inc.), 771 Ellicott Square, Buffalo, N. Y.—License no. 70:
Arsphenamine; neoarsphenamine; sodium arsphenamine; sulpharsphenamine.

Mallinckrodt Chemical Works, St. Louis, Mo.—License no. 77:
Arsphenamine; neoarsphenamine; sulpharsphenamine.

Merck & Co. (Inc.), Rahway, N. J.—License no. 82:
Arsphenamine; neoarsphenamine; sulpharsphenamine; a compound of glucose with arsphenamine base.

Terrell Laboratories, Texas National Bank Building, Fort Worth, Tex.—License no. 84:
Rabies vaccine (killed virus).

Jensen-Salsbery Laboratories, Twenty-first and Penn Streets, Kansas City, Mo.—License no. 85:
Botulinus antitoxin; antianthrax serum; rabies vaccine (killed virus); bacterial vaccine made from Brucella melitensis; diphtheria toxoid.

Hollister Stier Laboratories, Paulson Medical and Dental Building, Spokane, Wash.—License no. 91:
Acute anterior poliomyelitis serum (human); bacterial vaccines made from acne bacillus, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, pertussis bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and xerosis bacillus; pollen extracts; poison-ivy extract; poison-oak extract.

Medical Arts Laboratory, Medical Arts Building, Oklahoma City, Okla.—License no. 98:
Rabies vaccine (killed virus).

Bureau of Laboratories, Michigan State Department of Health, Lansing, Mich.—License no. 99:
Diphtheria antitoxin; scarlet fever streptococcus antitoxin; tetanus antitoxin; antimeningococcic serum; smallpox vaccine; rabies vaccine (Cumming); tuberculin old; bacterial vaccines made from paratyphoid bacillus A, paratyphoid bacillus B, and typhoid bacillus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization.

National Drug Co., 5109 Germantown Avenue, Philadelphia, Pa.—License no. 101:
Diphtheria antitoxin, perfringens antitoxin; tetanus antitoxin; vibrion septique antitoxin; antimeningococcic serum; antipneumococcic serum; antistreptococcic serum; normal horse serum; tuberculin old; smallpox vaccine; rabies vaccine (killed virus); bacterial vaccines made from acne bacillus, Brucella melitensis, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, meningococcus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; tetanus toxoid; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; pollen extracts.

Mulford Colloid Laboratories, 5109 Germantown Avenue, Philadelphia, Pa.—License no. 102:
Poison-ivy extract; poison-oak extract.

Allergy Laboratories, 1200 North Walker Street, Oklahoma City, Okla.—License no. 103:
Pollen extracts; vegetable food extracts; animal epidermal extracts

Hixson Laboratories (Inc.), Johnstown, Ohio.—License no. 104:
Diphtheria antitoxin; tetanus antitoxin; normal horse serum; rabies vaccine (killed virus); bacterial vaccines made from paratyphoid bacillus A, paratyphoid bacillus B, and typhoid bacillus; diphtheria toxin-antitoxin mixture; diphtheria toxoid; tetanus toxoid; diphtheria toxin for Schick test.

C. F. Kirk Co., Bloomfield, N. J.—License no. 105:
Bacterial vaccines made from acne bacillus, colon bacillus, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus and typhoid bacillus.

The Porro Biological Laboratories, Rhodes Medical Arts Building, Tacoma, Wash.—License no. 107:
Pollen extracts.

Knapp & Knapp, Independence, Mo.—License no. 108:
Pollen extracts.

Phagoid Laboratories (Inc.), Breslin Medical Arts Building, Louisville, Ky.—License no. 109:
Bacterial antigens made from colon bacillus, gonococcus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus.

Pitman-Moore Co., Zionsville, Ind.—License no. 110:
Tetanus antitoxin; antierysipeloid serum; rabies vaccine (killed virus); bacterial vaccines made from acne bacillus, colon bacillus, Brucella melitensis, Friedländer bacillus, gonococcus, influenza bacillus, micrococcus catarrhalis, micrococcus tetragenus, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pneumococcus, staphylococcus albus, staphylococcus aureus, streptococcus, and typhoid bacillus; bacterial antigens made from staphylococcus albus, staphylococcus aureus, streptococcus; diphtheria toxoid; pollen extracts.

The Wm. S. Merrell Co., Cincinnati, Ohio.—License no. 111:
Bacterial vaccines made from Brucella melitensis, colon bacillus, dysentery bacillus, Friedländer bacillus, gonococcus, micrococcus catarrhalis, paratyphoid bacillus A, paratyphoid bacillus B, pertussis bacillus, pseudodiphtheria bacillus, staphylococcus albus, staphylococcus aureus, staphylococcus citreus, streptococcus, typhoid bacillus; baterial antigens made from colon bacillus, staphylococcus albus, staphylococcus aureus, streptococcus, typhoid bacillus; diphtheria toxoid, diphtheria toxin for Schick test.

The Wyatt Clinic Research Laboratories, Tucson, Ariz.—License no. 112:
Bacterial antigen made from streptococcus.

Michael Reese Hospital, Twenty-ninth Street and Ellis Avenue, Chicago, Ill.—License no. 113:
Acute anterior poliomyelitis immune serum (human); measles immune serum (human); scarlet fever immune serum (human); normal human serum.

FOREIGN ESTABLISHMENTS

Institut Pasteur de Paris, Paris, France.—License no. 11. Selling agents for the United States, Mr. A. Charklian, Pasteur Vaccine Laboratories of France, 516 Fifth Avenue, New York, N. Y.:
Diphtheria antitoxin; tetanus antitoxin; antianthrax serum; antidysenteric serum; antiplague serum; antistreptococcic serum; bacterial vaccines made from cholera vibrio, plague bacillus, staphylococcus albus, and staphylococcus aureus.

Interessen Gesellschaft Farbenindustrie Aktiengesellschaft, Hoechst am Main, Germany.—License no. 24. Selling agents for the United States, The Winthrop Chemical Co., 170 Varick Street, New York City:
Tuberculin old; tuberculin T. R.; tuberculin B. E.; tuberculin B. F.; bacterial vaccines made from cholera vibrio, gonococcus, staphylococcus albus, staphylococcus aureus, and staphylococcus citreus; typhoid bacillus; sensitized bacterial vaccine made from typhoid bacillus; trichophyton extract; arsphenamine; neoarsphenamine; sodium arsphenamine; silver arsphenamine; neosilver arsphenamine; sulpharsphenamine; sulphoxylarsphenamine.

Connaught Antitoxin Laboratory, University of Toronto, Toronto, Canada.—License no. 73:
Diphtheria antitoxin; staphylococcus antitoxin; tetanus antitoxin; diphtheria toxoid; staphylococcus toxoid.

Laboratoire de Biochimie Médicale, 19-21 rue Van-Loo, Paris, France.—License no. 83. Selling agents for the United States, Anglo-French Drug Co., 1270 Broadway, New York City. Selling agents for Puerto Rico, Chas. Vere, box 210, San Juan, P. R.:
Sulpharsphenamine.

Instituto Sieroterapico Milanese, Via Darwin 20, Milan, Italy.—License no. 87. Selling agents for the United States, Opo-Pharmacal Co., 27 Cleveland Place, New York City; Italian Drugs Importing Co., 266 Lafayette Street, New York City.
Antianthrax serum; bacterial vaccines made from colon bacillus, gonococcus, pneumococcus, staphylococcus albus, staphylococcus aureus, staphylococcus citreus, and streptococcus; neoarsphenamine.

Boots Pure Drug Co., Ltd., Nottingham, England.—License no. 92. Selling agents for the United States. The United Drug Co., 43 Leon Street, Boston, Mass.:
Arsphenamine diglucoside.

Sero-Bacteriological Department, Bayer-Meister-Lucius, Behringswerke, I. G. Farbenindustrie, A. G. Section, Marburg-Lahn, Germany.—License no. 97. Selling agents for the United States, The Winthrop Chemical Co., 170 Varick Street, New York City.
Diphtheria antitoxin; tetanus antitoxin; antistreptococcic serum; normal horse serum; bacterial vaccines made from colon bacillus, gonococcus, pneumococcus, pyocyaneus bacillus, staphylococcus albus, staphylococcus aureus, and streptococcus.

Laboratoire de Bactériophage, 75 rue Olivier de Serres, Paris, France —License no. 108. Selling agents for the United States, Anglo-French Drug Co , 1270 Broadway, New York City; selling agents for Puerto Rico, Mr. Joaquin Belendez, San Juan, P R.

Bacterial antigens made from colon bacillus, dysentery bacillus, enterococcus, Friedländer bacillus, paratyphoid bacillus A, paratyphoid bacillus B, pneumococcus, proteus bacillus, pyocyaneous bacillus, staphylococcus albus, staphylococcus aureus, staphylococcus citreus. streptococcus, and typhoid bacillus.

Dr. Kade, Elisabeth Ufer 35, Berlin SO, 36, Germany.—License no. 114:

Bacterial vaccine made from colon bacillus.

La Biotherapie, 3 rue Maublanc, Paris, France —License no. 115.

Bacterial vaccines made from cholera vibrio, dysentery bacillus, paratyphoid bacillus A, paratyphoid bacillus B, and typhoid bacillus; bacterial antigens made from pneumococcus, staphylococcus albus, staphylococcus aureus, and streptococcus.

Laboratorio Brasileiro de Chimiotherapia, Rio de Janeiro, Brazil.—License no. 116:

Trichophyton extract.

DEATHS DURING WEEK ENDED JAN. 12, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce

	Week ended Jan 12, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	10,015	9,166
Deaths per 1,000 population, annual basis	14 0	12 8
Deaths under 1 year of age	653	610
Deaths under 1 year of age per 1,000 estimated live births	60	57
Deaths per 1,000 population, annual basis, first 2 weeks of year	13.8	12.9
Data from industrial insurance companies:		
Policies in force	67,078,894	67,359,046
Number of death claims	15,023	15,805
Death claims per 1,000 policies in force, annual rate	11.7	12.2
Death claims per 1,000 policies, first 2 weeks of year, annual rate	10.0	10.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Jan. 19, 1935, and Jan. 20, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 19, 1935, and Jan. 20, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 19, 1935	Week ended Jan. 20, 1934	Week ended Jan. 19, 1935	Week ended Jan. 20, 1934	Week ended Jan. 19, 1935	Week ended Jan. 20, 1934	Week ended Jan. 19, 1935	Week ended Jan. 20, 1934
New England States:								
Maine	4			2	190	8	0	1
New Hampshire	4	1	5		7	70	0	0
Vermont	1	1			7	25	0	0
Massachusetts	7	15			321	1,441	2	3
Rhode Island	6	1			25	4	0	0
Connecticut	11	5	96	12	529	17	1	0
Middle Atlantic States:								
New York	41	58	[1] 20	[1] 22	826	561	6	3
New Jersey	16	14	158	29	95	218	2	1
Pennsylvania	67	79			1,687	1,420	4	4
East North Central States:								
Ohio	37	56	57	8	430	122	2	1
Indiana	30	45	266	60	317	293	4	1
Illinois	48	35	146	43	1,533	219	10	6
Michigan	16	18	53	4	234	36	1	1
Wisconsin	1	2	56	48	817	220	2	2
West North Central States:								
Minnesota	8	21	1		1,195	79	1	0
Iowa	9	14	162	12	731	28	1	1
Missouri	50	59	458	15	276	614	0	0
North Dakota	7	5	88	4	105	242	0	1
South Dakota	3	2			37	294	0	0
Nebraska	4	13	1	12	90	49	0	0
Kansas	14	11	15	3	476	39	1	2
South Atlantic States:								
Delaware		6	6		1	91	0	0
Maryland [2,3]	7	9	603	32	38	57	3	0
District of Columbia	12	20	14	3	4	137	1	0
Virginia [3]	34	43			647	409	3	4
West Virginia	31	40		68	316	34	4	2
North Carolina	20	27	403	60	559	1,541	1	3
South Carolina [3]	5	14	1,050	683	19	329	0	0
Georgia [3,4]	15	11	657	79		667	2	0
Florida	4	10	108	1	11	8	1	0
East South Central States:								
Kentucky	20	12	209	4	376	17	1	0
Tennessee	28	20	224	103	32	587	3	2
Alabama [3]	11	33	893	105	218	241	0	2
Mississippi [3]	17	20					1	1
West South Central States:								
Arkansas	14	7	116	43	10	313	2	0
Louisiana	41	32	47	7	57	25	1	1
Oklahoma [5]	12	36	220	111	7	339	8	[illegible]
Texas [3]	76	173	320	202	301	906	3	[illegible]

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 19, 1935, and Jan. 20, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 19, 1935	Week ended Jan. 20, 1934	Week ended Jan. 19, 1935	Week ended Jan. 20, 1934	Week ended Jan. 19, 1935	Week ended Jan. 20, 1934	Week ended Jan. 19, 1935	Week ended Jan. 20, 1934
Mountain States:								
Montana	3	----	731	2	288	7	0	0
Idaho	----	3	12	----	15	51	0	0
Wyoming	1	----	----	----	13	16	0	0
Colorado	6	7	----	----	477	24	0	0
New Mexico	3	12	28	7	23	95	3	1
Arizona	1	4	112	10	14	9	0	2
Utah [2]	----	1	----	----	8	768	0	0
Pacific States:								
Washington	----	2	----	----	110	355	1	0
Oregon	2	10	134	27	22	33	0	1
California	32	52	252	32	148	339	4	3
Total	905	1,016	7,749	1,943	13,651	13,496	74	54

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 19, 1935	Week ended Jan. 20, 1934	Week ended Jan. 19, 1935	Week ended Jan. 20, 1934	Week ended Jan. 19, 1935	Week ended Jan. 20, 1934	Week ended Jan. 19, 1935	Week ended Jan. 20, 1934
New England States:								
Maine	0	0	17	5	0	0	0	1
New Hampshire	0	0	15	11	0	0	0	0
Vermont	0	0	21	16	0	0	0	1
Massachusetts	0	0	193	203	0	0	2	2
Rhode Island	1	0	16	28	0	0	0	0
Connecticut	0	0	65	71	0	0	0	0
Middle Atlantic States:								
New York	0	0	692	583	0	0	7	8
New Jersey	0	0	164	191	0	0	2	5
Pennsylvania	3	3	701	696	0	0	8	10
East North Central States:								
Ohio	0	1	599	422	1	2	5	6
Indiana	0	1	197	200	0	3	3	3
Illinois	0	1	807	500	3	5	13	8
Michigan	0	1	308	421	0	0	1	3
Wisconsin	0	0	577	175	14	54	3	0
West North Central States:								
Minnesota	2	1	103	93	16	4	0	2
Iowa	0	0	58	80	0	8	5	0
Missouri	0	0	77	167	1	5	6	7
North Dakota	0	0	55	17	0	0	0	0
South Dakota	0	0	16	18	4	1	0	0
Nebraska	0	0	49	29	15	8	1	1
Kansas	0	0	105	133	3	0	3	0
South Atlantic States:								
Delaware	0	0	16	17	0	0	0	0
Maryland [2,3]	0	0	94	83	0	0	3	1
District of Columbia	0	0	25	18	0	0	2	0
Virginia [3]	0	1	78	97	2	0	12	5
West Virginia	0	1	142	128	0	0	5	3
North Carolina	0	1	50	78	1	0	0	5
South Carolina [3]	1	0	14	6	0	0	4	4
Georgia [3,4]	0	0	18	15	0	0	2	4
Florida	0	0	8	5	0	0	0	5
East South Central States:								
Kentucky	1	3	68	61	0	0	2	2
Tennessee	0	1	59	62	0	1	3	0
Alabama [3]	0	1	19	29	1	2	2	5
Mississippi [3]	0	0	16	19	1	1	4	2
West South Central States:								
Arkansas	0	0	12	5	0	3	0	8
Louisiana	2	0	23	30	6	1	3	20
Oklahoma [5]	0	0	29	22	0	5	8	3
Texas [3]	3	0	92	122	6	12	19	15

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 19, 1935, and Jan. 20, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 19, 1935	Week ended Jan. 20, 1934	Week ended Jan. 19, 1935	Week ended Jan. 20, 1934	Week ended Jan. 19, 1935	Week ended Jan. 20, 1934	Week ended Jan. 19, 1935	Week ended Jan. 20, 1934
Mountain States:								
Montana	0	0	12	18	1	0	0	2
Idaho	0	0	8	14	0	1	2	1
Wyoming	0	0	15	2	14	7	0	9
Colorado	0	0	219	27	1	0	0	2
New Mexico	0	0	27	52	0	1	4	3
Arizona	0	1	37	17	0	0	1	1
Utah [2]	0	0	30	8	0	7	0	1
Pacific States:								
Washington	2	5	67	46	76	0	1	4
Oregon	0	0	79	48	5	3	2	6
California	15	4	264	331	9	24	6	6
	30	26	6,356	5,420	180	158	144	174

[1] New York City only

[2] Week ended earlier than Saturday

[3] Typhus fever, week ended Jan. 19, 1935, 15 cases, as follows: Maryland, 2; Virginia, 1; South Carolina 2; Georgia, 7, Alabama, 1; Texas, 2.

[4] Dengue, week ended Jan. 19, 1935, 21 cases, as follows: Georgia, 19; Florida, 2.

[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December 1934										
Illinois	29	261	173	9	3,956	1	4	2,591	7	86
Michigan	2	62	59	2	707		6	1,246	2	40
Minnesota	4	76	1		2,295		3	597	30	4
Nebraska	5	44			228		1	139	53	2
North Dakota	2	30	349		731			197	5	2
Ohio	10	382	773		1,401		9	2,752	8	39
Rhode Island	1	21	5		20		0	54	0	
South Carolina		121	3,060	355	24	73	4	33	1	9
South Dakota	2	7	11		213		0	139	43	5
Texas	11	407	977	1,305	122	24	8	285	21	179
West Virginia	4	148	266		1,048		2	532	12	42
Wyoming		0			34		0	66	19	5

December 1934

	Cases
Anthrax:	
Michigan	1
Texas	1
Chicken pox:	
Illinois	1,785
Michigan	2,326
Minnesota	995
Nebraska	242
North Dakota	179
Ohio	3,113
Rhode Island	178
South Carolina	103
South Dakota	83
Texas	255
West Virginia	220
Wyoming	42
Dengue:	
South Carolina	6
Texas	4

December 1934—Con.

	Cases
Dysentery:	
Illinois (amoebic)	19
Illinois (amoebic carriers)	48
Illinois (bacillary)	1
Michigan	2
Minnesota (bacillary)	2
Ohio	1
Texas	157
Epidemic encephalitis:	
Illinois	14
Michigan	2
North Dakota	1
Ohio	3
South Carolina	2
Texas	4
Food poisoning:	
Ohio	5

December 1934—Con.

	Cases
German measles:	
Illinois	398
Ohio	225
Wyoming	5
Hookworm disease:	
South Carolina	36
Impetigo contagiosa:	
South Dakota	1
Jaundice, epidemic:	
Minnesota	5
Lead poisoning:	
Illinois	3
Ohio	11
Mumps:	
Illinois	252
Michigan	390
Nebraska	50
North Dakota	4
Ohio	589

December 1934—Con.

	Cases
Mumps—Continued.	
South Carolina	172
Rhode Island	10
South Dakota	148
Texas	62
West Virginia	24
Wyoming	3
Ophthalmia neonatorum:	
Illinois	5
Ohio	81
South Carolina	9
South Dakota	1
Paratyphoid fever:	
Illinois	2
Michigan	6
South Carolina	1
Texas	4
Puerperal septicemia:	
Illinois	4
Ohio	6
Rabies in animals:	
Illinois	37
South Carolina	44
Rabies in man:	
Illinois	1
Septic sore throat.	
Illinois	9
Michigan	38

December 1934—Con.

	Cases
Septic sore throat—Con.	
Ohio	266
South Dakota	4
Wyoming	1
Tetanus:	
Illinois	2
Michigan	1
Ohio	2
Trachoma:	
Illinois	4
Michigan	1
Minnesota	1
South Dakota	1
Trichinosis:	
Michigan	1
Ohio	1
Tularaemia:	
Illinois	62
Michigan	5
Minnesota	1
North Dakota	1
Ohio	38
South Carolina	3
Texas	2
West Virginia	2
Typhus fever:	
Illinois	2
South Carolina	3
Texas	34

December 1934—Con.

	Cases
Undulant fever:	
Illinois	10
Michigan	12
Minnesota	4
North Dakota	1
Ohio	6
South Carolina	1
South Dakota	1
Texas	2
West Virginia	1
Vincent's infection:	
Illinois	19
Michigan	35
North Dakota	7
Whooping cough:	
Illinois	653
Michigan	718
Minnesota	233
Nebraska	11
North Dakota	78
Ohio	613
Rhode Island	57
South Carolina	121
South Dakota	52
Texas	393
West Virginia	289
Wyoming	16

CASES OF VENEREAL DISEASES REPORTED FOR NOVEMBER 1934

This statement is published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State health officers. They are preliminary and are, therefore, subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama [1]				
Arizona	22	.49	217	4.79
Arkansas [2]	369	1.97	231	1.23
California	1,382	2.25	1,373	2.26
Colorado [1]				
Connecticut	260	1.58	172	1.04
Delaware	203	8.42	27	1.12
District of Columbia	136	2.75	131	2.65
Florida	389	2.50	42	.27
Georgia	633	2.17	369	1.27
Idaho	0	0	0	0
Illinois	1,303	1.66	1,211	1.55
Indiana	234	.71	180	.55
Iowa [2]	105	.42	182	.73
Kansas	132	.69	81	.43
Kentucky	142	.51	273	1.03
Louisiana	187	.87	133	.62
Maine	43	.54	45	.56
Maryland	739	4.44	230	1.38
Massachusetts	390	.90	596	1.38
Michigan	525	1.04	489	.97
Minnesota	229	1.11	300	1.16
Mississippi [3]				
Missouri	332	.91	190	.52
Montana [2]	61	1.13	37	.69
Nebraska	52	.37	86	.62
Nevada [1]				
New Hampshire	19	.41	21	.45
New Jersey	550	1.31	261	.62
New Mexico [2]	48	1.11	42	.97
New York	5,067	3.91	1,559	1.20
North Carolina	1,234	3.77	351	1.07
North Dakota	14	.20	60	.87
Ohio [2]	785	1.15	223	.33
Oklahoma [3]				
Oregon	30	.40	60	.61
Pennsylvania	313	.32	365	.21

See footnotes at end of table.

Cases of venereal diseases reported for November 1934—Continued

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Rhode Island	100	1.42	47	.67
South Carolina [2]	244	1.40	314	1.80
South Dakota	7	.10	30	.43
Tennessee [2]	492	1.85	278	1.04
Texas	609	1.01	152	.25
Utah [1]				
Vermont	24	.66	29	.80
Virginia [2]	245	1.00	224	.92
Washington	183	1.14	213	1.33
West Virginia [3]				
Wisconsin [4]	31	.10	170	.57
Wyoming [1]				
Total	17,912	1.56	10,834	.94

[1] Not reporting.
[2] Incomplete.
[3] Have been reporting regularly but no report received for current month
[4] Only cases of syphilis in the infectious stage are reported.

NOTE.--Surveys in which all medical sources have been contacted in representative communities throughout the United States have revealed that the monthly rate per 10,000 population is 6.6 for syphilis and 10.2 for gonorrhea.

WEEKLY REPORTS FROM CITIES

City reports for week ended Jan. 12, 1935

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	1	0	3	3	7	0	0	0	7	35
New Hampshire:											
Concord											
Nashua	0			0		0	0	0	0	2	
Vermont:											
Barre	0		0	0	1	0	0	0	0	0	3
Burlington	0		0	0	0	8	0	0	0	2	4
Massachusetts:											
Boston	4		4	9	41	51	0	7	0	47	287
Fall River	0		1	148	4	2	0	2	0	12	33
Springfield	0		0	10	5	5	0	1	0	12	42
Worcester	0		1	0	23	11	0	2	0	9	75
Rhode Island:											
Pawtucket	0			0		0	0		0	0	24
Providence	3	1	1	3	10	9	0	3	0	8	69
Connecticut:											
Bridgeport	1	20	2	6	6	10	0	0	0	0	44
Hartford	0		1	122	9	7	0	5	0	15	56
New Haven	0	1	2	14	7	1	0	0	1	0	47
New York:											
Buffalo	0		3	56	23	88	0	10	0	41	168
New York	44	52	26	87	195	272	0	102	0	293	1,671
Rochester	1		0	94	5	8	0	1	0	15	75
Syracuse	0		0	2	8	5	0	1	0	23	56
New Jersey:											
Camden	1	5	3	0	7	3	0	1	0	5	41
Newark	2	38	1	2	22	13	0	9	1	64	140
Trenton	1	3	3	17	6	15	0	1	0	1	61
Pennsylvania:											
Philadelphia	9	27	16	6	46	70	0	24	5	158	521
Pittsburgh	7	22	13	75	33	44	0	9	0	84	184
Reading	0		1	2	1	15	0	3	0	3	43
Scranton	1			28		2	0		0	2	

City reports for week ended Jan. 12, 1935—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Ohio:											
Cincinnati	6	2	8	2	25	23	0	8	0	4	168
Cleveland	4	277	13	30	43	26	0	15	0	35	259
Columbus	4	4	4	46	6	32	0	0	0	1	87
Toledo	0	5	5	36	9	9	0	6	0	24	86
Indiana:											
Fort Wayne	3	------	0	2	13	6	0	0	0	0	42
Indianapolis	0	------	3	3	21	23	0	7	1	6	------
South Bend	0	------	0	55	6	3	0	0	0	5	21
Terre Haute	0	------	0	0	0	2	0	0	0	0	17
Illinois:											
Chicago	5	32	24	148	109	328	0	46	0	46	860
Springfield	1	2	0	1	4	15	0	0	0	7	26
Michigan:											
Detroit	6	51	9	49	50	80	0	16	0	55	328
Flint	0	7	0	21	6	15	0	1	0	2	37
Grand Rapids	0	------	1	8	2	11	0	0	0	26	39
Wisconsin:											
Kenosha	0	------	0	33	3	13	0	0	0	24	11
Madison	0	------	------	8	------	6	0	------	0	1	11
Milwaukee	0	------	0	117	11	339	0	6	0	85	106
Racine	0	------	0	3	1	4	1	1	0	2	17
Superior	0	------	0	2	0	0	0	0	0	0	6
Minnesota:											
Duluth	0	------	1	221	3	5	0	0	0	0	24
Minneapolis	2	------	2	758	8	39	0	1	0	10	109
St. Paul	1	1	1	20	17	13	1	1	0	14	70
Iowa:											
Des Moines	0	------	------	13	------	8	0	------	0	0	36
Sioux City	3	------	------	5	------	2	0	------	0	5	------
Waterloo	2	------	------	68	------	1	0	------	0	0	------
Missouri:											
Kansas City	4	------	2	18	29	6	0	3	0	0	110
St. Joseph	2	------	1	2	5	1	0	1	1	1	32
St. Louis	16	3	3	10	29	16	0	8	0	8	283
North Dakota:											
Fargo	0	------	0	------	1	8	0	0	0	8	6
Grand Forks	0	------	------	28	------	10	0	------	0	0	------
South Dakota:											
Aberdeen	1	------	------	10	------	1	0	------	0	3	------
Sioux Falls	0	------	------	0	------	0	0	------	0	0	10
Nebraska:											
Lincoln	------	------	------	------	------	------	------	------	------	------	------
Omaha	3	------	3	6	13	21	0	2	0	1	81
Kansas:											
Topeka	0	------	0	3	6	8	0	1	0	3	21
Wichita	4	------	1	7	5	1	0	1	0	0	41
Delaware:											
Wilmington	0	------	0	0	10	5	0	0	0	0	33
Maryland:											
Baltimore	1	138	13	3	59	42	0	9	0	45	300
Cumberland	0	------	0	6	0	4	0	0	0	0	17
Frederick	0	------	0	0	0	0	0	0	0	0	5
District of Columbia:											
Washington	6	22	13	9	42	27	0	14	0	10	218
Virginia:											
Lynchburg	2	------	0	39	------	10	0	2	0	0	13
Norfolk	0	------	1	1	7	5	0	2	0	17	40
Richmond	1	------	5	45	17	3	0	3	1	0	73
Roanoke	0	------	0	6	4	8	0	0	0	0	19
West Virginia:											
Charleston	0	------	0	17	5	0	0	2	0	0	27
Huntington	1	------	------	0	------	4	0	------	0	4	------
Wheeling	0	------	0	8	2	22	0	0	0	14	27
North Carolina:											
Raleigh	------	------	------	------	------	------	------	------	------	------	------
Wilmington	0	------	1	0	4	0	0	1	0	0	18
Winston-Salem	1	3	0	1	5	2	0	1	0	47	19
South Carolina:											
Charleston	1	151	2	0	4	0	0	2	0	0	33
Columbia	------	------	------	------	------	------	------	------	------	------	------
Greenville	0	------	0	0	0	0	0	0	0	0	4
Georgia:											
Atlanta	4	194	0	0	11	7	0	7	0	7	98
Brunswick	0	------	0	0	0	0	0	1	0	0	3
Savannah	2	55	4	2	4	1	0	5	0	2	47
Florida:											
Miami	1	1	0	1	2	0	0	0	0	0	29
Tampa	4	------	0	0	1	2	0	1	0	0	28

City reports for week ended Jan. 19, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Kentucky:											
Ashland	0	2		0		0	0		0	0	
Lexington	1		0	0	5	3	0	1	0	0	19
Louisville	8	33	1	13	11	11	0	6	0	8	90
Tennessee:											
Memphis	6		6	1	27	7	0	3	0	1	98
Nashville	0		1	0	13	7	0	6	0	4	84
Alabama:											
Birmingham	3	18	2	7	9	5	0	7	0	2	84
Mobile	1	2	1	0	5	4	0	1	0	0	27
Montgomery	3			6		1	0		0	0	
Arkansas:											
Fort Smith											
Little Rock	2		0	3	3	4	1	1	0	4	5
Louisiana:											
New Orleans	0	2	2	6	13	12	0	9	1	0	159
Shreveport	4		2	37	9	0	0	4	0	0	64
Oklahoma:											
Tulsa	0			2		0	2		0	4	
Texas:											
Dallas	9	2	1	2	10	4	0	1	1	0	53
Fort Worth	4		1	0	4	6	0	2	0	0	42
Galveston	1		0	0	0	0	0	0	0	0	14
Houston	14		0	1	7	0	0	5	0	0	79
San Antonio	2		0	0	6	4	0	6	0	0	71
Montana:											
Billings	3		0	15	0	1	0	0	0	0	13
Great Falls	1		0		1	2	0	1	0	1	5
Helena	0		0	39	0	0	0	0	0	0	4
Missoula	0		0	0	1	0	0	0	0	0	4
Idaho:											
Boise	0		0	0	0	0	0	0	0	0	5
Colorado:											
Denver	8	47	4	518	14	185	0	7	0	0	103
Pueblo	0		0	0	2	14	0	0	0	5	13
New Mexico:											
Albuquerque	0		2	2	5	2	0	4	1	0	29
Utah:											
Salt Lake City	0		3	8	3	69	0	0	0	20	43
Nevada:											
Reno	0		0	0	0	0	0	0	0	0	4
Washington:											
Seattle	0		1	2	6	5	2	2	0	5	88
Spokane	0	2	2	27	3	0	0	1	0	4	49
Tacoma	0		0	13	1	3	48	0	0	3	32
Oregon:											
Portland	0	2	2	6	13	18	0	2	0	0	79
Salem	0	2		0		1	0		0	0	
California:											
Los Angeles	17	80	0	8	16	66	8	21	2	7	416
Sacramento	3		1	1	2	3	0	5	0	6	35
San Francisco	2	9	3	3	13	11	0	13	1	4	181

City reports for week ended Jan. 12, 1935—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths	
New York:			
New York	1	2	0
Pennsylvania:			
Philadelphia	1	1	0
Pittsburgh	1	1	0
Ohio:			
Cincinnati	8	7	0
Columbus	1	0	0
Illinois:			
Chicago	4	2	0
Michigan:			
Detroit	1	0	0
Wisconsin:			
Milwaukee	1	1	0
Minnesota:			
Duluth	1	1	0
Minneapolis	1	0	0
St. Paul	1	1	0
Missouri:			
St. Joseph	3	0	0
St. Louis	1	0	0
Nebraska:			
Omaha	1	2	0
Maryland:			
Baltimore	2	2	0
South Carolina:			
Greenville	1	0	0
Kentucky:			
Louisville	0	1	0
Tennessee:			
Nashville	2	1	0
Alabama:			
Mobile	1	0	0
Colorado:			
Denver	1	0	0
Washington:			
Seattle	0	0	3
Oregon:			
Portland	0	1	0
Salem	0	0	1
California:			
Los Angeles	0	0	1
Sacramento	0	0	3

Dengue.—Cases: Savannah, 4; Tampa, 1.
Epidemic encephalitis.—Cases: Chicago, 1; Birmingham, 1; San Francisco, 1.
Pellagra.—Cases: Charleston, S. C., 1; Savannah, 1; Birmingham, 1; New Orleans, 1.
Typhus fever: Savannah, 1 case.

FOREIGN AND INSULAR

CUBA

Provinces—Notifiable diseases—4 weeks ended December 15, 1934.—During the 4 weeks ended December 15, 1934, cases of certain notifiable diseases were reported in the Provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer		1	2	5	1		9
Chicken pox						1	1
Diphtheria		3	2	4		1	10
Hookworm disease	1			5			6
Leprosy		2		2		16	20
Malaria	597	39	270	977	1,604	1,396	7,883
Measles	2	4	1	13			20
Poliomyelitis	4		6	2	1	1	14
Scarlet fever						3	3
Tuberculosis	4	6	40	51	10	30	141
Typhoid fever	1	4	15	40	16	11	87

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Jan. 25, 1935, pp. 115–120. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Feb. 22, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

India—Negapatam.—Cholera has been reported in Negapatam, India, as follows: During the week ended January 5, 1935, 3 deaths; and during the week ended January 12, 1935, 9 deaths.

Plague

China—Manchuria.—A report dated January 7, 1935, states that 4 imported deaths from pneumonic plague have occurred near Kanping, about one hundred kilometers northwest of Mukden, Manchuria, China. The district is isolated.

Yellow Fever

Gambia—Bathurst.—On January 1, 1935, 1 case of yellow fever was reported at Bathurst, Gambia.

Gold Coast—Oda.—During the period January 7–9, 1935, 3 cases of yellow fever were reported at Oda, Gold Coast.

Niger Territory—Zinder.—On January 10, 1935, 1 case of yellow fever was reported at Zinder, Niger Territory.

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HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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ENDAMOEBA HISTOLYTICA IN WASHINGS FROM THE HANDS AND FINGER NAILS OF INFECTED PERSONS

By BERTHA KAPLAN SPECTOR, *Ph. D., Associate Protozoologist, United States Public Health Service, Research Associate, Department of Medicine (Douglas Smith Foundation) of the University of Chicago;* JOHN W. FOSTER, *M. D., Chicago,* and NELSON G. GLOVER, *Senior Bacteriologist, Bureau of Laboratories, Board of Health, Chicago*

In an earlier publication by Spector and Buky (1) it was shown that hands artificially contaminated with positive stools soon cease to yield living cysts of *E. histolytica* when exposed to conditions permitting of prompt drying of the contaminated hands. In the tests referred to, the authors purposely refrained from making conditions favorable for survival, having in mind rather those that probably would prevail under natural circumstances.

Andrews (2) has recently studied the same subject, using a different procedure in his work. Special efforts were made to contaminate the subjects in the space beneath the finger nails. Andrews found that a few cysts survived 20 minutes, and that ordinary hand washing was generally sufficient to free the hands from infective material.

The present work was designed to determine the presence of cysts of *E. histolytica* on the hands under natural conditions rather than under conditions of artificial contamination. The procedure was as follows: When a carrier was detected in routine examination he or she was asked to return the following day for a second examination. At the second examination, the individual was asked to pass a fresh specimen of feces in the usual manner. The subject was instructed, immediately after the use of toilet paper and before washing the hands, to rinse the hands thoroughly in sterile saline or distilled water contained in a sterile vessel. After this the finger nails were thoroughly cleaned with a sterile toothpick and cut with sterile scissors into the same container. These washings and parings were placed in large sterile centrifuge tubes and centrifuged at a medium low speed for 5 to 10 minutes. The supernatant fluid was carefully removed and the sediment was examined with 1:1000 aqueous eosin and an iodine solution (5 percent aqueous potassium iodide saturated with iodine and diluted with equal parts of distilled water) for the ready detection of cysts and for the determination of their state as to viability.

In order to determine the relative persistence, under the conditions of the experiment, of *E. histolytica* and members of the *Coli-aerogenes* groups of bacteria, Endo plates were made from the washings in 54 cases.

RESULTS

Of the 74 persons thus examined, the finger nails and hand washings of 5, or 6.8 percent, were positive, 2 showed very few live *E. histolytica* cysts of the large variety, 1 showed very few dead *E. histolytica* cysts of the large variety, and 2 showed live cysts of the small variety. One man, a plasterer, showed a number of large cysts of free-living *amoebae.*

Of these 74 washings, 54 were cultured for *B. coli-aerogenes* organisms, of which 15, or 27.7 percent, were positive.

TABLE 1.—*Results of examinations made of stools, hands, and finger-nail washings of persons infected with E. histolytica*

Number of persons	Stool findings positive for *E. histolytica*				Results of hand and finger-nail washings				
					B. coli-aerogenes		E. histolytica		
	Number showing trophozoites	Number showing trophozoites and cysts	Number showing large cysts	Number showing small cysts	Number cultured	Number positive	Number showing large live cysts	Number showing large dead cysts	Number showing small live cysts
74	11	1	49	13	54	15	2	1	2

DISCUSSION

It appears from the data presented that persons whose stools are known to contain living *E. histolytica* do not frequently contaminate their hands with these organisms under ordinary conditions. Only 5 of 74 such persons were found to have contaminated their hands during the procedures connected with the discharge of feces, even when the hands were examined immediately after defecation.

In the light of these findings, it would seem that contamination of food by carriers of *E. histolytica* under the ordinary conditions of food handling must occur infrequently. It must be remembered that the subjects of these tests were examined before their hands were cleansed after defecation and that the material in the space beneath the nails was examined as well as any adhering to the hands and nails. In view of the results of the work of Andrews, already referred to, it would seem that the number of positives obtained in our experiments would have been even smaller had the subjects been

permitted to wash their hands before collecting the material for examination.

REFERENCES

(1) Spector, B. K., and Buky, F.: Viability of Endamoeba histolytica and Endamoeba coli. Pub. Health Rep., 49: 379–385 (1934).
(2) Andrews, Justin: The retention of Endamoeba histolytica cysts under finger nails. Am. Jour. Trop. Med., 14· 439–441 (Sept. 1934).

A COMPARATIVE STUDY OF STREPTOCOCCAL IMMUNITY PRODUCED IN RABBITS BY HEAT-KILLED CULTURES, BY ACTIVE BACTERIOPHAGE, AND BY INACTIVATED BACTERIOPHAGE

By ALICE C. EVANS, *Senior Bacteriologist, United States Public Health Service*

In a recent paper (1933) the writer showed that mice and rabbits experimentally infected with a virulent strain of hemolytic streptococcus received no benefit from treatment with a single dose of a specific bacteriophage administered at the same time or a few days previous to the infecting dose. The failure of therapeutic action was ascribed to inhibition of lysis by the body fluids, as demonstrated in test-tube experiments.

In the present study an attempt was made to compare the immunizing properties of bacteriophage preparations and those of antigens made in the usual manner when administered to animals a suitable period of time in advance of the infecting organism.

The use of bacteriophage preparations as antigens for the treatment of human diseases was suggested by certain theoretical considerations. A bacteriophage preparation contains a complex mixture of antigenic substances. It contains the protein of the medium in various stages of degradation; it contains the metabolic products elaborated by the bacteria prior to their dissolution; it contains the lytic principle; and it contains the dissolved bacterial cells. There is a belief that the latter should excel as an immunizing agent.

D'Herelle asserted that in the state of solubility produced by the phage the bacterial substance is particularly adapted to stimulate the cells of the body which enter into the production of immunity. The statement was made following experiments on immunization against avian typhoid, hemorrhagic septicemia in the buffalo, and experimental infection with the Shiga type of dysentery in the rabbit. D'Herelle's claim for the excellence of lysed bacterial substance as an antigen was favorably received by many clinicians, although the controlled experiments of subsequent investigators failed to agree in corroborating the claim.

Although there have been no experimental studies with streptococcus phage as an immunizing agent, it may be purchased on the market for use "in the treatment of localized streptococcus infections

of various types of the skin and soft tissues and in septicemia." Certain statements in the literature seem to justify this use of streptococcus phage.

Referring to the use of streptococcus phage, Dutton states that the bacterial antigens in a filtrate of lysed bacterial cells are specific and more potent than the whole bacteria. Powell, Jamieson, and Jones state that "our rationale of the use of phage has been to utilize it as a means for producing the most desirable form of effective soluble antigen rather than as an ultimate therapeutic agent."

The use of bacteriophage as a "supervaccine" was favorably considered in a recent editorial in the Journal of the American Medical Association. After commenting on the possibly beneficial effect of the nonspecific protein reaction following the intravenous injection of peptone, the advantages of the disintegrated bacteria are thus stated: "It is obvious that any benefit arising from the introduction of specific antigen would be enhanced by their presence in a more soluble and hence more available form." Two weeks after the appearance of this editorial a second editorial appeared in the same journal which virtually revoked the previous favorable comments and warned against relying on a remedy whose usefulness has not been proved. This incident illustrates the confusion which necessarily arose as a result of the utilization of bacteriophage for the treatment of human diseases before the theory that it might be the most efficacious form of antigen had been adequately tested.

Although it cannot be assumed that facts established for one bacterial species and its specific phage will be true in regard to other bacterial species and their respective phages, nevertheless facts established in one case are suggestive of what may be looked for in others. In none of the work briefly reviewed here were the experiments concerned with streptococcus phage as an antigen.

The experiments of Jungblut and Schultz indicate that lysis by bacteriophage changes the bacterial protein to a substance which possesses antigenic properties differing from those of the original protein. They found that no reaction occurred when uterine strips of animals sensitized to intact or autolyzed bacilli of the dysentery and colon types were tested for anaphylaxis with homologous phage lysates; and, vice versa, there was no contraction of uterine strips sensitized to phage lysates upon contact with homologous bacterial autolysates.

The reported experiments showing protection against various diseases by treatment with phage were reviewed recently by Larkum and also by Kendrick. A number of investigators, working with various races of phage, were able to demonstrate protection in animals treated with phage. Only a very few experiments, however, have been carried out to compare the efficacy of phage with that of killed

intact cells as an immunizing agent. A brief review of these experiments follows:

Compton reported an experiment with 5 mice treated with antiplague phage, 6 treated with vaccine, and 4 untreated controls. None of the vaccine-treated mice, and none of the controls survived the test dose of virulent control bacilli, whereas two of the phage-treated mice survived. Compton's results have been quoted repeatedly as a demonstration of the efficacy of phage as an immunizing agent without mentioning that his conclusions were based on only two surviving mice. The many times that this insignificant experiment has been quoted bears witness to the lack of adequate experimental data on the value of bacteriophage as an immunizing agent.

Maitra and Mallick failed to demonstrate protection against cholera organisms in rabbits treated with bacteriophage. They then treated rabbits (the number was not given) with cholera vaccine to which phage had been added, and found no better protection than in rabbits treated with vaccine alone. Kendrick treated 23 rabbits with bacteriophage and 6 with killed virulent *Salmonella suipestifer*. Three of the animals treated with phage, and 1 treated with killed bacteria survived the lethal test dose; 25 untreated controls died. The difference between the protection afforded by the two kinds of vaccine was insignificant, though the slight difference was in favor of the killed bacteria.

EXPERIMENTAL PROCEDURES

The experimental animals were white mice and rabbits weighing from 2 to 2.5 kilograms. When two or more lots of animals were immunized in comparative experiments, those of the higher and lower weights were distributed as evenly as possible between the lots.

Two strains of hemolytic streptococci were used in these experiments. They were chosen on account of their high degree of virulence for rabbits. Streptococcus 639 was used in experiments previously reported (1933, 1934). Streptococcus 687 was received from Dr. M. G. Colvin, who used it in his studies. He obtained it from an abscess in a guinea pig.

Strains 639 and 687 belong to distinct phagological groups according to their sensitiveness to nascent phage, as reported in the previous publication (1934). Strain 687 is sensitive to the four types of streptococcus phage, A, B, C, and D. On the other hand, strain 639 is sensitive to only one type, B. Reciprocal agglutinin absorption tests showed that strains 639 and 687 belong to serologically distinct groups, for neither absorbed agglutinins from the heterologous immune serum.

The streptococcus cultures were maintained in broth containing 10 percent of rabbit blood. Transfers were made about once a year. The cultures were incubated overnight, then they were capped with vaseline and kept in a refrigerator at a temperature slightly above freezing. Kept in this manner, the virulence of the cultures remains undiminished indefinitely. When animal inoculations were to be made, a few drops of the stock culture were added to a tube of broth. After incubation overnight, the culture was diluted for use according to the needs of the experiment. Both strains 639 and 687 were usually lethal to white mice in 1×10^{-8} cc of 24-hour broth culture, which contained only a few units of streptococci, the unit being a single coccus, a pair, or a chain from which a colony would develop on blood agar.

The B type of phage was used in all the experiments reported in this paper. As in the previous report (1934), the lytic filtrates are designated by a combination of the designations of the type of phage and the streptococcus culture which served as a substratum. Thus the lytic filtrates used in this study were B/639 and B/687.

SUSCEPTIBILITY OF RABBITS TO EXPERIMENTAL STREPTOCOCCUS INFECTION

In order to give a correct interpretation to the results of the immunity experiments in rabbits it was necessary to establish the susceptibility of rabbits to experimental infection with strains 639 and 687. Tables 1 and 2 give the available data. The animals which supplied these data were the control animals in various experiments carried out over a period of about 2 years. The results are comparable, however, because there has been no deterioration in the virulence of the stock cultures.

Table 1 shows that a dose of 0.0001 cc of culture 639 killed rabbits, but that higher dilutions were innocuous. A considerable percentage of animals, however, appeared to be immune. Some of those which showed immunity resisted as much as 100 times the dose which was fatal to the majority of animals.

Table 2 shows that the virulence for rabbits of strain 687 is definitely higher than that of strain 639. A dose of 0.0000001 cc of strain 687 was fatal to the one rabbit inoculated with that dose. On the other hand, a dose 1,000 times as large failed to kill all of the inoculated animals. The irregularities in the susceptibility of rabbits to streptococcal infection must be considered in the interpretation of results of the immunity experiments.

TABLE 1.—*The virulence of strain 639 for rabbits*

Dose	Rabbit nos.	Results
0.1 cc	27, 70, 80, 81	All 4 died, on the third, fourth, fourth, and seventh days.[1]
0.01 cc	28, 29, 126, 127, 128	4 died, on the sixth, eighth, ninth and sixteenth days. 1 was ill with temperature of 41° C. or higher for 5 days and recovered.
0 001 cc	1, 30, 31, 36, 37, 38, 45, 47, 76, 129, 130, 131.	8 died, on the fifth, sixth, sixth, eighth, eighth, ninth, twelfth, and thirty-first days. 4 survived. A temperature of 41° C. or higher for one or more days was the only evidence of illness.
0 0001 cc	23, 25, 32, 77	All 4 died, on the fifth, eighth, tenth, and twelfth days.
0.00001 cc	26, 78	Both survived. There was no rise in temperature nor any other evidence of illness.
0.000001 cc	24	Survived. There was no evidence of illness.

[1] Streptococci were cultured from the heart blood of all rabbits whose death is recorded in this table excepting no. 30, which died on the thirty-first day. The severe illness with high temperature which resulted from the inoculation was followed by progressive emaciation.

TABLE 2.—*The virulence of strain 687 for rabbits*

Dose	Rabbit nos.	Results
0.01 cc	84, 85, 86	Died on the third, third, and fourth days.[1]
0.001 cc	82, 110	Died on the second and third days.
0.0001 cc	83, 111, 150, 190, 191, 192, 193	6 died; 3 on the second, 2 on the third, and 1 on the sixth days. 1 survived; there was a temperature of over 41° C. for 3 days.
0.00001 cc	112, 113, 117, 118, 123, 149, 179, 180, 181.	6 died; 2 on the second, 1 on the third, and 3 on the fourth days. 3 survived; none showed a rise of temperature.
0.000001 cc	114, 119, 121, 132, 133	1 died, on the fourth day. 4 survived; none showed a rise of temperature.
0 0000001 cc	115	Died on the seventh day.

[1] Streptococci were isolated from the heart blood of all the rabbits whose death is recorded in this table.

The following facts suggest that possibly the resistant animals encountered in the course of these experiments may have become immune through spontaneous infections. Among a large collection of hemolytic streptococci, the strains of the group to which strain 687 belongs were from infected material from a wide variety of animal species, including rabbits. Further, it was found that immunity produced in experimental animals by the injection of antigens derived from strain 687 protected against lethal doses of strain 639 as well as against lethal doses of strain 687, although, as already pointed out, the two strains belong to distinctly different groups of streptococci. The data for the cross-immunity tests will be given further on.

EXPERIMENT 1

Two lots of 10 rabbits each were immunized in the first experiment—one lot with lytic filtrate B/639 and the other with an equal volume of killed culture of streptococcus 639. Thus the two kinds of antigen contained bacterial substances derived from the same strain of streptococcus, but the amount of bacterial substances was greater in the heat-killed antigen.

For the preparation of the heat-killed antigen, broth cultures were incubated overnight, and then were heated in a 56° water bath for 1 hour.

For the preparation of the lysed antigen, broth was planted with bacterial culture, lytic filtrate was added, the culture was incubated overnight and then filtered. When streptococcus 639 and diluted phage B/639 are added to broth, and the culture is incubated, the bacteria multiply until the culture becomes turbid; then clearing occurs. The resulting titer of phage is always about 10^{-9} regardless of how many bacteria or how many phage particles were added, provided overwhelming bacterial inoculations were not made. In preparing the lysed antigen 1 drop of culture and 1 cc of undiluted phage were added to tubes containing 9 cc of broth. After incubation overnight, the lysate was filtered through a Berkefeld N filter and stored in the refrigerator for use.

Both lots of rabbits received 12 intravenous injections of antigen at 3- or 4-day intervals. The first 3 doses were with 0.5 cc, the next 3 were with 1.0 cc, and the last 6 doses were with 2 cc of antigen. Thus each rabbit received altogether 16.5 cc of antigen. A few rabbits died of snuffles during the period of immunization. Seven rabbits of the lot treated with killed culture and nine of the lot treated with lytic filtrate survived in good condition. The rabbits treated with killed culture made an average gain of 54 grams each during the period of immunization, whereas those treated with phage lost an average of 53 grams. Eight days after the last inoculation the animals of both lots and six untreated control rabbits were given an intravenous injection of living broth culture of streptococcus 639. The treated rabbits of each lot were divided into 3 groups, which received 0.1, 0.01, and 0.001 cc of culture, respectively.

The results of the protection tests are given in table 3. Considering the irregularity of the susceptibility of rabbits to infection with strain 639, as discussed in connection with table 1, the results recorded in table 3 are nevertheless definite. The data show that treatment with either type of antigen gave a certain degree of immunity, but that treatment with killed culture gave a greater degree of protection than treatment with lytic filtrate. The superiority of killed culture as an antigen is best shown in the group of rabbits which received a test dose of 0.1 cc of culture. Two of 3 rabbits treated with killed culture survived, whereas none of the 3 rabbits treated with lytic filtrate survived. That a certain degree of immunity resulted from treatment with phage is best shown in the group receiving a test dose of 0.001 cc of culture. All 3 of the phage-treated rabbits in that group survived, whereas, according to the data given in table 1, the test dose is lethal to about two-thirds of normal rabbits.

TABLE 3.—*Comparative immunity produced in rabbits by treatment with killed culture 639 or lytic filtrate B/639*

Test dose	Rabbit nos.	Treatment	Results
0.1 cc	4, 5, 6	Killed culture	2 survived. 1 died (fifth day).[1]
	13, 15, 16	Phage	All 3 died (fourth, fifth, and sixth days).
	27	Untreated	Died (fourth day).
0.01 cc	7, 8	Killed culture	Both survived
	17, 18, 19	Phage	2 survived. 1 died (eighth day).
	28, 29	Untreated	1 died (tenth day). 1 survived.
0.001 cc	9, 10	Killed culture	Both survived.
	20, 21, 22	Phage	All 3 survived.
	30, 31	Untreated	Both died (sixth and thirty-first days).
0.0001 cc	32	do	Died (eighth day).

[1] Streptococci were cultivated from the heart blood of all rabbits whose death is recorded in this table, except no. 30, which died on the thirty-first day. (See footnote to table 1 for discussion.)

The results of experiment 1 may be briefly summarized as follows: Of the 6 control animals, 16⅔ percent survived; of the 9 phage treated animals, 56 percent survived; of the 7 animals treated with killed culture, 86 percent survived the test dose.

EXPERIMENT 2

It was demonstrated in the first experiment that a certain degree of protection may be obtained by treating rabbits with phage. The second experiment was planned to determine whether a higher percentage of animals could be protected by treating with larger doses of phage, over a longer immunization period.

Eight rabbits were treated at 3- or 4-day intervals with lytic filtrate, prepared as for experiment 1. During the course of the immunization, 1 rabbit was chloroformed on account of an injury and 2 rabbits died of undetermined causes. The 5 surviving rabbits each received altogether 61 cc of phage in 18 doses increasing from 1 to 8 cc. There was an average loss in weight of 25 g apiece. Ten days after the last injection the 5 treated animals and 3 untreated control rabbits were each given 0.1 cc of broth culture, intravenously. All of the control animals and 2 of the 5 treated rabbits died between the third and seventh days. Streptococci in pure culture were cultivated from the heart blood of all 3 control animals, and from 1 of the treated animals.

No growth was obtained in cultures planted with the heart blood of the other treated rabbit (no. 51), which died on the sixth day after inoculation. The autopsy findings in this animal, however (consolidation of the tips of the lobes of the lungs) were typical of animals which succumb to infection with streptococcus 639. In speculating whether the failure to obtain the streptococcus from this animal may have been due to the presence of bacteriophage, it is of interest to recall that 3 days after the injection of a normal rabbit with this phage, it could not be demonstrated in the blood but could be demonstrated in the spleen, as reported in an earlier publication (1933). It

seems probable that rabbit 51 died as the result of the experimental infection, and that the presence of bacteriophage may have prevented the cultivation of the streptococcus.

Experiment 2 may be summarized with the statement that 60 percent of animals were protected against approximately 1,000 lethal doses of streptococcus by prolonged treatment with large doses of phage. None of the three phage-treated animals of experiment 1 survived an equivalent test dose. Therefore a stronger immunity was obtained with the prolonged treatment with large doses of phage, but it was a slightly weaker immunity than was obtained by treatment with a much less quantity of killed culture in experiment 1, when 2 out of 3, or 66⅔ percent, of treated rabbits survived a similar test dose.

Since the animals of experiment 2 received almost four times as large a quantity of antigen as those of experiment 1, the data indicate that, in the case of strain 639, killed culture is a more efficient antigen than bacteriophage for the immunization of rabbits.

EXPERIMENT 3

This experiment, carried out with antigens prepared with the use of strain 687, was planned to compare the value as immunizing agents of heat-killed culture, active bacteriophage, or bacteriophage inactivated by heat. An effort was made to have approximately the same quantity of bacterial protein in the lysed antigens as in the killed culture. To prepare the antigens two series of test tubes containing 9 cc of broth each were planted with 0.5 cc of overnight culture. To each tube of one series was added 1 cc of lytic filtrate B/687 diluted 10^{-4}. The tubes were incubated and were examined every 15 minutes beginning with the third hour. Sometimes the turbidity would increase equally in both series of tubes until the fifth or sixth hour, when one by one the cultures of the series to which phage had been added would suddenly become clear. The tubes of both series were then removed to the refrigerator. If lysis was incomplete when the cultures were removed from the incubator, it proceeded to completion in the cold. Sometimes lysis occurred after 3 or 4 hours' incubation. At that time the cultures contained too little bacterial cell material to be satisfactory for antigens. The contents of one tube of growing pure culture were then added in equal amount to two tubes of clearing cultures. Turbidity again increased for a time, and clearing took place for the second time after about 2 hours. The cultures of both series were then removed to the refrigerator, the total period of incubation having been 5 or 6 hours. The lysed cultures always contained approximately 10^9 phage corpuscles per cc and they were estimated to contain a quantity of bacterial cell material approximately similar to that in the pure streptococcus cultures.

The lysed cultures were sterilized by passing through a Berkefeld N filter. For the inactivated phage antigen the lytic filtrate was heated an hour at 65° C. The streptococcus cultures were killed by heating at 56° C. for 1 hour.

Eighteen rabbits were treated with the various antigens, with 6 in each group. Each animal received 16.5 cc of antigen in 12 doses increasing from 0.5 to 2.0 cc. The treatments were given at 3- or 4-day intervals.

The gain in weight during the course of immunization was practically the same for the groups receiving killed culture and active phage—214 grams for the one, and 218 grams for the other. One animal receiving inactivated phage died during the course of immunization.

The surviving animals were tested for immunity 7 days after the last inoculation. Each received an intravenous injection of 1 cc of culture 687 diluted 1 to 10^5. According to the data presented in table 2, the inoculating dose was at least 100 times the dose lethal to some rabbits.

The results of experiment 3 are presented in table 4. The test dose killed 2 of the 3 control animals. The groups which had received treatments with killed culture and with active phage showed the same degree of protection, with 5 out of 6 animals surviving in each lot. The group which had received inactivated phage showed a lesser degree of protection, with 3 out of 5 rabbits surviving.

TABLE 4.—*Comparative immunity produced in rabbits by treatment with killed culture 687, active lytic filtrate B/687, or lytic filtrate inactivated by heat. The test dose was 0.00001 cc of culture 687*

Rabbit nos.	Treatment	Results	Percentage of survivals
92, 93, 94, 95, 96, 97	Active phage	5 survived; 1 died, tenth day [1]	83.3
104, 105, 107, 108, 109	Phage inactivated by heat.	3 survived; 2 died, on the second and third days.	60
98, 99, 100, 101, 102, 103	Killed culture	5 survived; 1 died, fourth day.	83.3
117, 118, 123	None (controls)	1 survived; 2 died, both on fourth day.	33.3

[1] Streptococci were cultivated from the heart blood of all the animals which died.

The 5 surviving rabbits of the lot which had been treated with killed 687 culture, and the 5 surviving rabbits of the lot which had been treated with active phage (see table 4) were all in good condition, none of them having shown any elevation in temperature following the first test dose. Twenty-three days after the first test dose of culture 687 the animals of each lot were divided into two groups and given a second test dose of 1 cc of a 1 to 10^2 or 1 to 10^3 dilution of culture 639. The results of this experiment are recorded in table 5. The data recorded in the table may be summarized as follows: 100 percent of the animals which had been immunized with heat-killed culture sur-

vived the second test dose, and 40 percent of the animals which had been treated with active phage survived the test dose, whereas only 16.6 percent of the control animals survived.[1]

It has already been stated that strains 639 and 687 belong to different groups of hemolytic streptococci according to phagological and serological reactions. Experiments 1 and 2 demonstrated that treatments with active lytic filtrate B/639 failed to develop as strong an immunity against experimental infection with strain 639 as could be produced by treatments with the homologous culture killed by heat. The data presented in table 5 demonstrate that immunization with antigen prepared with culture 687 protected against experimental infection with strain 639, but that the immunity produced by treatments with the active heterologous lytic filtrate was definitely lower than that produced by treatments with heterologous culture killed by heat. Thus the results obtained in experiments 1 and 2 were confirmed.

TABLE 5.—*Comparative immunity to a test dose of a heterologous streptococcus in rabbits treated with killed culture 687 or with lytic filtrate B/687*

Rabbit no.	Immunizing treatment	First test dose, with homologous streptococcus	Second test dose, with heterologous streptococcus	Results
92	12 doses (16.5 cc) of active lytic filtrate B/687.	1 cc of a 1 to 10^6 dilution of culture 687.	1 cc of a 1 to 10^4 dilution of culture 639.	Died, ninth day.[a]
93				Slightly elevated temperature for 5 days; survived.
94				Died, seventh day.
98	12 doses (16.5 cc) of culture 687 killed by heat.			High temperature lasted 11 days; survived.
99				Do.
126	None (controls)	None		Died, eighth day.
127				Died, sixteenth day.
128				Died, sixth day.
95	12 doses (16.5 cc) of active lytic filtrate B/687.	1 cc of a 1 to 10^5 dilution of culture 687.	1 cc of a 1 to 10^3 dilution of culture 639.	No rise in temperature; survived.
96				Died, twelfth day.
100				No rise in temperature; survived
101	12 doses (16.5 cc) of culture 687 killed by heat.			Do.
102				High temperature for 3 days; survived.
129	None (controls)	None		Died, eighth day.
130				Do.
131				High temperature for 6 days; survived.

[a] Streptococci were cultivated from the heart blood of all the rabbits which died.

The results of experiment 3 indicate that strains 687 and 639 are further unlike in that treatments with active lytic filtrate protect against 687 as well as treatments with killed culture, whereas lytic filtrate is inferior as an antigen for protection against strain 639,

[1] Further experiments to show cross immunity between hemolytic streptococci of different groups will be the subject of another publication. It may be stated here briefly, however, that the reverse of the cross experiment recorded above showed definite cross immunity. Rabbits immunized with antigens prepared with streptococcus 639 were protected against lethal doses of streptococcus 687.

whether the antigen be homologous or heterologous to the infecting dose.

The next experiment, with white mice as the experimental animals, confirmed the data of experiment 3 in showing that protection against strain 687 may be produced as readily with the homologous active lytic filtrate as with the homologous killed culture for antigen.

EXPERIMENT 4

Two groups of 12 mice each were given 3 treatments, 1 group with killed culture 687 and the other with active lytic filtrate B/687. The same lots of antigen which were prepared for experiment 3 served for this experiment also. The treatments were with 0.3, 0.5, and 1.0 cc of antigen injected intraperitoneally at weekly intervals. Three mice of the group receiving killed culture, and two of the group receiving phage died during the course of immunization. The surviving mice and 10 untreated control mice each received a test dose of 1 cc of culture 687 diluted 1 to 10^7, one week after the last immunizing dose.

The results of the experiment are given in table 6.

TABLE 6.—*Comparative values of killed culture 687 and active lytic filtrate B/687 for the production of immunity in mice*

Number of mice	Treatment	Test dose	Results	Percentage of survivals
10	Lytic filtrate	1 cc culture 687 diluted 1 to 10^7.	6 died [1]; 4 survived	40
9	Killed culture	do	5 died; 4 survived	44.4
10	None (controls)	do	8 died; 2 survived	20

[1] Streptococci were cultured from the heart blood of all.

The protection afforded by the treatments was slight, with 40 and 44.4 percent of mice surviving in the treated groups, compared with 20 percent surviving in the control group. The percentage of surviving mice in the two groups treated with the different types of antigen was as nearly alike as was possible with the limited number of animals in the experiment.

THE ANTIGENIC VALUE OF PHAGE INACTIVATED WITH MERTHIOLATE

Basing their conclusions on a study of staphylococcus bacteriophage, Powell, Jamieson, and Jones reported that bacteriophage titers do not show critical decreases when preserved with merthiolate in a dilution of 1 to 5,000 and kept at about 5°. Contrary to their conclusions, however, an examination of commercial samples of phage-lysed streptococcus products preserved with merthiolate revealed that some samples contained no active lytic agent. Further, the writer

found that streptococcus phage is sensitive to merthiolate. (See the previous publication for details.) Since the inactivated products are sold for use as vaccines it seemed important to determine whether phage inactivated by merthiolate would compare favorably with active phage as an antigen.

EXPERIMENT 5

Lytic filtrate B/687 with a titer of 10^{-9} was prepared in the same manner as for experiments 3 and 4. It was divided into 2 portions, 1 of which was placed in the refrigerator where no deterioration occurred. The other portion was distributed in a thin layer in cotton-stoppered Erlenmeyer flasks, merthiolate was added in the proportion of 1 to 10,000, and the flasks were placed in an incubator at 37° C. Under those conditions the lytic agent was much deteriorated or completely inactivated within a week.

One group of 7 rabbits was treated with the active phage, and another group of 8 rabbits was treated with phage containing merthiolate which had been held at 37° C. for a week or more.

Both lots of rabbits received the same quantities of antigen, on the same dates, injected at intervals of 3 or 4 days. The first 3 doses were with 1 cc of antigen, followed by doses of 2 cc until a total of 23 cc had been injected. During the immunization the animals of the lot receiving the active phage gained, on the average, 793.6 grams. Those of the lot receiving the phage with preservative gained, on the average, 639.4 grams. Seven days after the last treatment, a test dose of 1 cc of culture 687 diluted 1 to 10^5 was inoculated into the ear vein of each of the treated animals and 6 untreated control rabbits. Three days later 1 of the control rabbits was dead, but none of the others showed any evidence of infection. (A drop of the inoculum spread on blood agar plate had shown that the culture used for the inoculum had not grown as profusely as usual.) The animals were again inoculated with a dose of 1 cc of culture 687 diluted 1 to 10^5. Two days later, since the temperature records suggested that there might be several survivals among the control animals, a third test dose of 1 cc of the same culture diluted 1 to 10^4 was given.

The results of the experiment are presented in table 7. Of the control animals, 16⅔ percent survived; of those treated with active phage, 71.4 percent survived; and of those treated with phage containing merthiolate, 100 percent survived. These data confirm those of the previous experiments in showing that lytic filtrate B/687 is an effective immunizing agent under the conditions of these experiments; and they show that inactivation with merthiolate does not injure its antigenic property.

TABLE 7.—*Comparative immunity produced in rabbits by treatment with active lytic filtrate B/687 or phage inactivated with merthiolate. The test dose was streptococcus 687 in 3 successive treatments. (See the text.)*

Rabbit nos.	Treatment	Results	Percentage of survivals
134, 135, 136, 137, 138, 139, 140	Active phage	5 survived, 2 died, on the ninth and sixteenth days.[1]	71.4
141, 142, 143, 144, 145, 146, 147, 148	Phage inactivated with merthiolate.	All survived (1 had a high temperature for 6 days).	100
149, 150, 151, 152, 153, 154	None (controls)	1 survived, 5 died; 1 on the third, 2 on the eighth, 2 on the ninth days.	16.6

[1] The dates of death are calculated from the date of the first test dose. Streptococci were cultivated from the heart blood of all rabbits which died.

IMMUNIZATION VALUE OF A SINGLE DOSE OF LYTIC FILTRATE

D'Herelle reported that steers could be immunized against hemorrhagic septicemia (barbone) of the buffalo by a single injection of bacteriophage, and that this immunity was maintained for as long as 14 months. In one of the experiments which he reported, steers were protected against 1,000 surely fatal doses by a single injection of 0.25 cc of bacteriophage. Our next experiment was carried out to show whether immunity against experimental streptococcal infection in rabbits could be established with a single dose of bacteriophage.

EXPERIMENT 6

Seven rabbits were treated with a single injection of lytic filtrate B/639. The doses for the animals in each of two groups varied from 0.01 to 2 cc. For one group of 3 rabbits the interval between phage treatment and test dose of streptococcus was 1 month; for the other group of 4 rabbits the interval was 2 months. The 7 treated animals and 3 untreated control animals (the same 3 which served for controls for experiment 2) were inoculated with 0.1 cc of broth culture of streptococcus 639. The results of the experiment are given in table 8. The controls and 6 of the treated animals died between the third and tenth days. One treated rabbit which had received 2 cc of phage survived. Although none of four control animals which have been inoculated with as much as 0.1 cc of broth culture of strain 639 have survived (see table 1), the natural resistance of some rabbits to experimental infection with this strain must be considered in interpreting the significance of the one surviving animal.

TABLE 8.—*Lack of immunity resulting from treatment with a single dose of phage B/639. Test dose was 0.1 cc of streptococcus 639*

Rabbit no.	Quantity of phage in single treatment	Interval between treatment and test dose	Result
	Cc	*Days*	
67	2.0	63	High temperature for 9 days, recovered.
69	0.1	63	Died, third day.[1]
70	0.01	63	Died, fifth day.[2]
71	2 0	31	Died, tenth day.[3]
72	1.0	31	Died, fifth day.[1]
73	0.1	31	Died, fourth day.[1]
74	0 01	31	Do [1]
79, 80, 81	None (controls).		All died, 2 on the third, 1 on the seventh day.[1]

[1] Streptococci were cultivated from the heart blood.
[2] No growth from heart blood.
[3] No growth from heart blood, but streptococci were cultivated from the spleen.

Streptococci failed to grow in cultures planted with the heart blood of 2 of the rabbits (nos. 70 and 71). They were cultivated from the spleen of no. 71, but plantings were not made from the organs of no. 70. A high temperature developed in rabbit 70 the day following inoculation, and the autopsy did not reveal any other cause for disease. Hence it appears that this animal died of streptococcus infection, and that in the case of both rabbits nos. 70 and 71 the presence of phage may have caused the streptococci to disappear from the blood. A similar observation was discussed in connection with experiment 2.

EXPERIMENT 7

An experiment similar to no. 6 was carried out to show whether a single dose of B/687 phage would protect against streptococcus 687. Four rabbits were treated with 2, 1, 0.1, and 0.01 cc of phage, respectively, 65 days previous to giving the test dose; and four more rabbits were treated with the same quantities of phage 24 days previous to giving the test dose. Four untreated control rabbits and the eight treated animals received a test dose of 0.0001 cc of streptococcus 687. There were no survivals. Streptococci were cultivated from the heart blood of all of them.

The results of experiments 6 and 7 may be summarized with the statement that treatment with a single dose of phage failed to protect rabbits against either streptococcus 639 or 687 under the conditions of the experiments.

THE PRODUCTION OF AGGLUTININS

Incidentally to the protection experiments, observations were made on the comparative response of agglutinating antibody in rabbits treated with lytic filtrate or with whole streptococcus cultures killed by heat. No report was found in the literature of similar com-

parative observations on the production of streptococcal agglutinins. Kendrick's review of the literature on the agglutinin response to injections with phage lysates of various other bacterial species points out that some investigators have reported that the antigenic value of bacterial substance dissolved by the action of phage is superior to the antigenic value of normal whole bacteria, whereas other investigators have reported the opposite results. Kendrick found that the agglutinin response to treatment with killed whole culture of *Salmonella suipestifer* was uniformly higher than the response to treatment with the corresponding phage lysates. The observations reported here are in agreement with those of Kendrick.

Samples of about 5 cc of blood were taken from the ear vein of the immunized rabbits on the day before the test dose was given (about a week after the last immunizing dose). The agglutinin content of the serum from these samples was determined, using samples of serum obtained from the same rabbits previous to the first immunizing dose as controls.

The agglutinating suspensions were prepared as follows: Cultures grown overnight in glucose broth were killed by heating at 56° C. for 1 hour. They were then centrifugated, washed with saline, and suspended in buffered saline of pH 7.0, so that the final turbidity was equivalent to 1,000 parts per million of the silica standard. One-half cc of bacterial suspension was added to a similar quantity of serum in falling dilutions. Readings were made after 4 hours in a water bath at 55° C. Any clumping visible through a hand lens was regarded as positive.

The serum from the animals of experiment 1 (see table 3), which received 16.5 cc of killed whole culture 639, contained agglutinins in titers varying from 1:400 to 1:3200. On the other hand, no agglutinins could be demonstrated in the serum of the animals of experiment 1, which received 16.5 cc of lytic filtrate B/639, although some of them were found to be immune to at least 100 lethal doses (see table 3). The serum of the animals of experiment 2, which received 61 cc of lytic filtrate B/639, contained agglutinins in low titers varying from 1:10 to 1:100.

The serum from the animals of experiment 3 (see table 4), which received 16.5 cc of killed whole culture 687, contained agglutinins in a titer of about 1:80, whereas those which received a similar quantity of bacterial substance dissolved by phage contained agglutinins only in the very low dilutions of 1:10 or 1:20, although they were immune to many times a lethal dose of streptococci.

D'Herelle warns against the repeated injection of phage for fear of developing a state of hypersensitivity against the specific organism, which he designates as "antiphylaxis." He quotes other authors

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who have also observed this phenomonon. He states, however, that not all races of phage possess the property of causing antiphylaxis.

This hypersensitive state was never observed in the course of the experiments recorded here, neither in animals which received a course of treatment with streptococcus lytic filtrate nor in animals to which a single dose of lytic filtrate was given 1 or 2 months before the test dose. On the other hand, there was some evidence of a hypersensitive state in animals which received a single dose of lytic filtrate simultaneously with the test dose or 3 days previously. The data were given in the earlier publication (1933).

SUMMARY AND CONCLUSIONS

The following conclusions are based on the results obtained in immunity experiments with 2 strains of hemolytic streptococci and 1 race of bacteriophage. There were 63 treated rabbits and 19 treated mice used in the experiments, with adequate controls.

A higher percentage of rabbits were protected against lethal doses of streptococcus 639 by treatments with heat-killed culture than by treatments with culture lysed by phage.

The two kinds of vaccine proved to be equally efficacious in producing immunity against streptococcus 687 in both rabbits and mice.

Inactivation with merthiolate did not injure the antigenic property of streptococcus lytic filtrate.

There was no immunity produced in rabbits by a single treatment with phage given 1 or 2 months previous to the test dose.

The serum of rabbits immunized with phage showed agglutinins only in the very low dilutions of 1:10 or 1:20.

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PRINCIPLES OF SANITATION AND HYGIENE FOR A CORRECTIONAL INSTITUTION [1]

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Sanitation and hygiene in correctional institutions embrace, in general, all measures incident to the prevention of disease. They involve the application, under conditions peculiar to prison life, of all the principles relating to the preservation of health commonly described in the field of hygiene. They constitute a protective agency and in this sense differ from the practice of surgery or medicine, which aim to correct physical defects. Individual or personal hygiene usually includes such subjects as cleanliness of the body, exercise, and habits, while group hygiene refers to more extensive measures directed toward the welfare and protection of the population as a whole. Preventive medicine is regarded by some as a more comprehensive term applicable to all possible protective health measures, including immunization. Prevention of disease and protection of health of prison populations necessarily must include all measures pertaining to hygiene, sanitation, and preventive medicine. For our purposes the terms are synonymous.

It is impossible to describe in the present paper all the technical details and problems with which the prison health official is concerned. For instance, occasional health problems, such as managing an epidemic of meningitis or procedures incident to detecting carriers of communicable diseases, cannot be included. The present paper is more directly concerned with sanitation in the restricted sense as relating to environment. It deals with the removal or correction of obvious elements detrimental to the health of the prison community. It embraces routine health problems in which prison officials, medical officers, and inmates are daily and mutually concerned. In this

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respect it resembles, to some extent, a treatise on municipal housekeeping.

The prison health officer is largely responsible for the development of sanitary measures. He is an agent who offers the prison community something of value in the form of health protection in return for a minimum expenditure of energy and work. The members of the prison population, like civilian communities, generally consider sanitation and public health good assets but frequently expect to get it free and are unwilling to work for it. It is well known that the removal of collections of filth, the development of pure water supplies, and the construction of extensive sewer systems have almost eradicated cholera from the cities of the United States and reduced typhoid fever to one-tenth of its former prevalence. Federal penal and correctional institutions are now equipped with satisfactory sewerage systems and pure water supplies. It remains for those concerned with the custody and health of these institutions to see that the water remains pure, that the sewerage systems function properly, and that filth and dirt do not accumulate.

A few examples of early prison construction still exist in the United States. The cells are small and contain no plumbing. There is little ventilation except that which comes through the heavily grated doors. Buckets with lids are used for toilet purposes, and a pail and cup provided for water. Largely due to poor sanitary conditions, severe outbreaks of typhoid, typhus or jail fever, cholera, and dysentery were frequent in early prison history. The cells of our Federal prisons are equipped with running water, toilet, and wash bowls. Only abouth one-fourth the time is required to keep them in a sanitary condition as compared with the bucket brigades of the older type of institutions. It is not only just and reasonable but one of the primary principles of prison sanitation that the modern cell should be free from objectionable odors and kept spotlessly clean.

The success of prison sanitary procedures is dependent on the united efforts of custodial and medical officers. The officials concerned with the enforcement of such measures naturally should have some conception of the reasons for them. The medical officer should endeavor to educate the prison community by taking pains to explain in nontechnical language what he wants done in each case and the reasons for doing it. Each inspection affords him an opportunity to instruct a number of persons. There is a tendency for them to pass the advice to others until eventually all know what is expected. Whenever possible, he will avoid dealing in personalities. The ideal reaction on the part of inmates, or others, with whom he deals, is achieved when there is left a state of mind which considers only the unsanitary condition while the medical officer and other officials are forgotten. The sanitary officer should be considered a friend rather

than a trouble maker or an enemy. The greatest source of his power is derived through favorable sentiment of the prison community. Such power and influence cannot be secured through threats or curt orders but rather through persistent effort and constructive work.

Various sanitary codes and regulations have been promulgated by municipalities and military and other organizations as guides in protective health practice. Such codes give reasons for health protective measures and the manner in which they should be carried out. They are designed for the health officer, the enforcement officer, and the layman. Every correctional institution needs similar regulations for the guidance of the prison sanitary officer, the administrative officers, and the prison population. The text of the code should be precise, yet complete, and couched in untechnical language which can be readily understood by all concerned. The clearer and simpler its form, the more useful it becomes. Revisions and additions are always in order when indicated. An outline of such a code, embracing the more important sanitary factors peculiar to prison life, follows.

SANITARY RULES AND REGULATIONS

All medical officers, guards, foremen, and others concerned are expected to familarize themselves with the following regulations and to see they are duly observed and enforced in their respective departments. A constant and high standard of sanitation and health can be maintained only when every employee charged with the care of inmates understands what is expected and is willing to do his part. When possible, sanitary irregularities or any existing condition detrimental to the health of the individual inmate or the population as a whole should be corrected, or reported at once. (Suggestions whereby further improvement may be achieved are always welcome.)

SANITARY INSPECTION

The chief sanitary officer, or his representative, will conduct formal tours of inspection at monthly intervals. He will be accompanied by the lieutenant of the day watch or other officer designated by the deputy warden. Inspection will include the living, eating, and working quarters of the inmate population as well as the grounds, buildings, and other parts of the institution. Special attention will be given to the storage, preparation, and handling of food, the waste disposal facilities, and the water supply.

The chief sanitary officer will act in an advisory capacity, making verbal recommendations concerning irregularities to the lieutenant of the day watch who is especially concerned with the enforcement of sanitary rules and regulations. When marked unhygienic conditions

are found which may affect the health of the prison population as a whole, or which are of such a nature as to require changes in plumbing or architecture, or other alterations involving expense, the matter will be presented to the warden in form of a special written report by the chief sanitary officer.

The guards in the cell-wings, kitchen, and elsewhere will be advised in advance of the time of formal inspection in order that lockers, boxes, and storerooms may be opened without delay. However, informal inspections may be held at any time and without notice, but will be conducted in such a manner as not to disturb or interfere with the duties of personnel unless conditions found warrant such action.

HEALTH PRECAUTIONS ON ADMISSION OF NEW INMATES

New inmates are immediately conducted to the dressing room in the cell-block, where they are divested of all clothing. The old clothing is to be kept entirely separate from the prison clothing and is either destroyed by burning or returned to the inmate's home without delay. A medical officer will inspect each new inmate, regardless of the hour, for the purpose of segregating men afflicted with communicable diseases and admitting those to the hospital who are ill. He will also supervise the bathing of new inmates and the application of mercurial ointment or other preventive measures against the spread of vermin. Due precautions will be observed in preventing contact between new inmates and the resident population. Any information relating to the exposure of new inmates to contagious diseases, while in jails or during transfer, obtained by guards or others should be immediately reported to the chief sanitary officer.

HEALTH PRECAUTIONS DURING PERIOD OF QUARANTINE

Inmates free from demonstrable disease will be held in admission quarantine, a section of the cell-house segregated from the remainder of the population, for a period of 30 days. During this period they will not be permitted to come in contact or mingle with the general population. However, they are permitted to visit the hospital, social service, educational and other agencies when necessary for study and classification purposes.

The physical and mental condition of new prisoners are usually poor, due to arrest, trial, commitment, deprivation of drugs or other stresses which they have recently experienced. Many of them are ignorant of the rudimentary principles of sanitation and hygiene even if they are able and willing to follow such measures. For this reason unusual patience and diligence must be exercised by guards and others in the observation, instruction, and discipline of new inmates. Unusual conduct on the part of new prisoners suggesting evidence of

mental disorder or any evidence indicating the development of disease of any kind must be reported without delay.

The quarantine quarters will be inspected at frequent intervals by a medical officer for evidence of the development of disease among new arrivals. The sanitation of quarantine cells is to be carried out in a manner similar to the methods described below under "cell-sanitation." It is obvious that the proper start of the new inmate, while confined in quarantine, has a favorable influence not only in connection with his reaction toward sanitary and health matters but on his general adjustment when assigned elsewhere in the institution.

THE CARE OF LIVING QUARTERS OR SANITATION OF CELLS

Inmates spend more than half their time in their cells. It is obvious that such living quarters should always be kept as clean and inviting as possible. The condition and color of the walls have an intangible but definite affect upon many of the occupants. The paint should be of a subdued tone and kept in good condition. Pictures, clippings, or other articles must not be nailed or pasted on the cell walls. Such practice not only defaces the surface of the walls but provides unnecessary collecting points for dust and vermin. Authorized pictures may be suspended from a string stretched along the wall between two nails in the upper corners of the cell. The cell walls must not be defaced with drawings, writing, or dirt.

The lighting must be kept as uniform as possible throughout the various cells. Daylight illumination must not be obstructed by hanging shelves, calendars, mirrors, or pictures on the bars. Poor illumination at night is frequently due to the collection of dust and dirt on the electric-light bulb. It must be kept clean at all times.

Mattresses and bedding will be routinely removed from each cell once weekly and hung over the railing for a period of one half day. This measure insures proper airing and drying of bedding and is very helpful in eliminating obnoxious odors. All linen must be changed at weekly intervals. During winter months the temperature should be kept between 65° and 75° F. The ventilator must be kept free from dust, dirt, and obstructions. It should never be covered with pictures, shelves, or other objects. The wash and toilet bowls must be kept scrupulously clean. For this purpose each cell should be furnished with one bar of cleansing compound each month. The collection of old newspapers, magazines, books, extra clothing, bottles, and other objects which tend to decrease air space and collect dust and vermin is prohibited.

The cell must be properly swept, bowls cleaned, and bed made each morning before the occupant leaves. Defects in plumbing, especially leaking pipes or obstruction to the water supply, must be reported and corrected without delay. The use of insecticide sprays and blow

torches as measures for the eradication of vermin should be used weekly unless other means are prescribed by the chief sanitary officer.

SANITATION OF THE BARBER SHOP AND BATH HOUSE

Shaving cups and brushes, razors, and hair brushes may collect bacteria from a person on whom they are used. An instrument may pick up pus germs from minute pimples on the face and transfer them to another person. The organisms of ringworm and barbers itch may be thus transferred. For this reason all cups, lather brushes, and tools, except steel tools which might be injured thereby, must be thoroughly cleansed in hot water in each instance before using. Hair brushes and all other brushes and tools which might be injured by cleansing in hot water must be kept clean and in a sanitary condition at all times.

After serving a person who has eruptions on the face or scalp, the barber shall thoroughly sterilize all metal tools, brushes, and combs that have been used on such person in a 2 percent lysol solution for 15 minutes before using such articles again. Every barber shall thoroughly cleanse his hands with soap and water before serving each person. No barber shall be assigned to the barber shop for duty who is afflicted with an infectious or communicable disease which, in the judgment of the prison health officials, renders him unfit for such duty. A steam towel may be used for more than one person, provided it is folded and reversed in such a manner that only an unexposed portion of the towel comes in contact with the face of each person, except that a towel used on a person with a skin eruption on the face must not be used on another person before being laundered.

The barber shop must be supplied with running hot and cold water, be adequately drained, and kept in a clean and sanitary condition. Sanitary inspections will usually be made during working hours.

The bath room is more extensively used than the barber shop. The majority of inmates are permitted to have safety razors and shave themselves. Practically all inmates patronize the common bath room. Each inmate is required to bathe once weekly. Exceptions are made in the case of kitchen workers, certain labor gangs, and shop workers who are permitted to bathe more frequently.

The facilities provided for the ventilation and drainage of the bath room must be kept in good condition and placed in constant operation on bathing days. All plumbing and bathing fixtures must be kept in working order. Following the use of the bath room, the floors, seats, and walls must be thoroughly scrubbed. The floors and seats shall be sprinkled with 12 percent sodium thiosulphate solution twice weekly during the summer months and once weekly during the winter months as a preventive measure against the spread of ringworm

infection. Ordinary sprinkling cans such as used for plants may be used for this purpose.

The stimulating effect of a good bath and clean clothing under sanitary conditions on the inmates moral sense cannot be over-estimated.

FOOD, DINING ROOM, AND KITCHEN

The nutritive requirement for inmates has been carefully calculated and compiled by authorities on diet in the Bureau of Prisons. The sanitary officer will do his utmost to cooperate with the steward and prison administration in regard to the preparation and serving of the "standard ration" in an inviting and sanitary manner. Food supplies will be inspected at intervals at the time of receipt, storage, and preparation. Special attention will be given to the cleanliness of storerooms, bakeries, refrigerating rooms, kitchen, and dining room.

The sanitary officer will be guided by the "Regulations Governing the Meat Inspection of the United States Department of Agriculture" in connection with the sanitation of premises used for storing meat and the acceptance or rejection of meat received for prison use. Raw milk must conform to the requirements described in "The Standard Milk Ordinance and Code recommended by the United States Public Health Service for Adoption by Cities." Fortunately most contractors who bid on milk abide by this code and there is usually but little cause to worry about the condition of milk when delivered. Due precautions must be observed in the handling and storage of milk supplies after they are received.

No inmates shall be permitted to work in the dining room or kitchen or handle food who, in the judgment of the health officials, are so afflicted with disease as to constitute a menace to the prison population.

Other matters which fall within the province of sanitation of the kitchen and eating quarters of inmates are the methods employed in washing and sterilizing dishes and tableware, the cleanliness of floors, walls, and tables, the methods in force for the eradication of ants, cockroaches, flies, and other pests, and the proper management and disposal of garbage and waste.

INDUSTRIAL HYGIENE AND SANITATION

The physical welfare of inmates assigned to work in the factories and shops is to be safeguarded. Some of the most important points which have a bearing on this matter are as follows:

1. The protection of workers from harmful dust, fumes, and poisonous chemicals and gases.
2. The construction of guards for dangerous machinery.
3. The installation of devices for stopping machinery quickly or automatically in case of accident.

4. Many inmate workers have but little knowledge of trade dangers, take no precautions, and are careless or indifferent.

The chief sanitary officer shall be an active member of the safety council committee, which is guided by the recommendations of the National Safety Council, of which the Bureau of Prisons is a member. The sanitary officer will be especially concerned with the records and reporting of injuries and illness due to occupation.

MENTAL HYGIENE

All concerned with the custody and care of inmates encounter certain mental health problems which have a definite bearing on such tangible matters as suicide, injury to others, or destruction to property. The detection and disposition of obvious mental defects such as feeblemindedness, epilepsy, or active hallucinations is clear. They are entirely medical problems. On the other hand, there is a large group of inmates in every correctional institution afflicted with border-line mental defects or abnormal personalities.

If at the time of examination such characteristic symptoms as irritability, inability to control the passions, suspicion, resentfulness, depression, and general egocentric tendencies can be demonstrated, there can be but little doubt concerning the type of inmate at hand. Such symptoms, although slight in themselves, gain additional significance when found associated. A few afflicted inmates at the time of primary examination, or even throughout the period of quarantine, are on their guard and give no history or evidence of mental instability. They are occasionally passed as normal and take their place in the general prison population. Under conditions peculiar to prison life such inmates frequently react with more or less characteristic behavior which is inconsistent with efficiency. They are usually persons who are unable to render proper service when assigned to duty. They constitute a source of trouble, and no system yet devised will make them adequate. They are especially prone to episodes during periods of disappointment or trouble, such, for example, as bad news from the outside or denial of parole. Occasionally they show suicidal, antagonistic, or destructive tendencies. It is important, therefore, that they be properly classified as soon as possible and admitted to the psychopathic ward or assigned to living quarters and positions as nearly in keeping with their mental fitness as possible. With this end in view all medical officers, guards, foremen, and others should report the following types of cases:

1. Inmates showing unusual difficulty in learning their work or general instructions, when not clearly due to unfamiliarity with the English language.
2. Persistently delinquent, irresponsible, obtuse inmates.
3. Inmates who are unusually eccentric, seclusive, or taciturn.

4. Those showing marked emotional instability, i. e., too easily moved to tears, anger, or noisy elation.

5. Those indulging in or suspected of abnormal sexual practices.

6. Those having fainting spells.

7. Persistent bed wetters.

8. Chronic ailers showing no evidence of organic disease, neurotic individuals, or suspected malingerers.

9. Apathetic, negligent, untidy, or otherwise seemingly objectionable individuals.

10. Those showing undue excitement, depression, shyness, timidity, stupidity, sleeplessness, tendency to sleep walking or other characteristics which may gain for them the title of "boob", "crank", "nut", and the like.

It is desirable that the report be in written form and in terms of the observed facts. It is important that observations be made quietly and unobtrusively so that the inmate shall not know his mental condition is under question and that the matter be kept from becoming a subject of gossip. Guards and foremen often appreciate the value of psychiatric examinations as much as medical officers. This is because they rate the men under their charge in terms of conduct, behavior, and efficiency, which involves a standard equivalent to that of the psychiatrist, who estimates and predicts conduct from the mental make-up of the inmate.

Some officers are reluctant to submit written reports on the conduct and behavior of men under their charge. The sanitary officer, during tours of inspection, has an opportunity to inquire about the progress and mental health of inmates in the various parts of the institution. Officers should be impressed with the importance of the detection of mental abnormalities in the early stage. All reports should be treated seriously even if poorly founded. Failure to act on a given case, even though it proves to be unimportant, may discourage the officer from further effort.

MISCELLANEOUS

There are numerous other health protective measures with which the prison health officer and others are concerned. Reference will be made to only a few of them, as follows:

Ventilation, heating, and lighting of shops, school rooms, and buildings.

Sanitation of shop lavatories.

Proper drainage of grounds.

Prevention of collections of refuse on the institution grounds.

Provisions for and care of receptacles for cigarette stubs and other refuse.

Abatement of nuisances, such as unnecessary odors, smoke, and noise.

Discouraging of the taming and maintaining of pets such as rats, mice, and birds.

Collection and disposal of institutional waste and garbage according to accepted sanitary practice.

Seasonal campaigns against flies, mosquitoes, and other pests.

COURT DECISION ON PUBLIC HEALTH

City held liable for sewage pollution of stream.—(Oklahoma Supreme Court; *City of Edmond* v. *Billen et al.*, 38 P.(2d) 564; decided Dec. 11, 1934.) In an action against a city in which the plaintiffs complained of the action of the city in dumping sewage into a natural watercourse running through the farm of the plaintiffs, one paragraph of the syllabi by the supreme court reads as follows:

> Where a municipal corporation discharges sewage into a river or creek, polluting the water of the stream, causing it to become foul and impregnated with noxious and poisonous substances, rendering it unfit for domestic or other uses, and thereby creating and maintaining a nuisance, which is detrimental to the health, comfort, and repose of a lower riparian owner and diminishes the value or destroys an established business of such riparian owner, such municipal corporation is liable for damages arising from the maintenance of such nuisance.

The judgment of the trial court in favor of the plaintiffs was affirmed.

DEATHS DURING WEEK ENDED JAN. 19, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Jan. 19, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	9,331	8,800
Deaths per 1,000 population, annual basis	13.0	12.3
Deaths under 1 year of age	629	578
Deaths under 1 year of age per 1,000 estimated live births	58	53
Deaths per 1,000 population, annual basis, 3 weeks of year	13.5	12.7
Data from industrial insurance companies:		
Policies in force	67,102,924	67,487,068
Number of death claims	16,247	16,515
Death claims per 1,000 policies in force, annual rate	12.6	12.8
Death claims per 1,000 policies, 3 weeks of year, annual rate	10.9	10.9

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Jan. 26, 1935, and Jan. 27, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 26, 1935, and Jan. 27, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 26, 1935	Week ended Jan. 27, 1934	Week ended Jan. 26, 1935	Week ended Jan. 27, 1934	Week ended Jan. 26, 1935	Week ended Jan. 27, 1934	Week ended Jan. 26, 1935	Week ended Jan. 27, 1934
New England States:								
Maine	2	2	7	2	191	1	0	0
New Hampshire	1			1	6	67	0	0
Vermont					1	35	0	0
Massachusetts	6	18			271	1, 521	0	0
Rhode Island	4	3	3	1	31	2	0	0
Connecticut	3	6	42	40	419	14	0	1
Middle Atlantic States:								
New York	60	59	[1] 17	[1] 25	823	620	6	1
New Jersey	23	25	54	30	139	135	0	1
Pennsylvania	61	81			1, 697	1, 667	4	3
East North Central States:								
Ohio	66	44	205	8	428	263	15	0
Indiana	29	30	164	55	626	220	0	4
Illinois	45	38	125	56	1, 925	214	5	11
Michigan	18	11	39	1	270	47	0	2
Wisconsin	3	13	140	46	765	299	2	0
West North Central States:								
Minnesota	5	7	2	3	1, 207	187	0	1
Iowa	4	7	48	18	1, 066	80	2	0
Missouri	59	63	423	39	441	785	7	1
North Dakota	7	5	11	3	67	166	2	1
South Dakota	3				59	317	1	0
Nebraska	8	11	6		232	78	1	0
Kansas	11	13	40	6	735	61	8	0
South Atlantic States:								
Delaware		5	6			87	0	0
Maryland [2]	5	7	339	33	64	48	1	1
District of Columbia	7	11	32	5	23	156	3	0
Virginia	16	26			582	570	5	2
West Virginia	34	19	233	63	372	27	1	0
North Carolina	35	41	374	109	728	2, 423	1	1
South Carolina	5	13	1, 226	744	28	336	0	0
Georgia [3] [4]	14	19	1, 324	184		1, 271	2	1
Florida	6	15	52		25	43	1	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 26, 1935, and Jan. 27, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 26, 1935	Week ended Jan. 27, 1934	Week ended Jan. 26, 1935	Week ended Jan. 27, 1934	Week ended Jan. 26, 1935	Week ended Jan. 27, 1934	Week ended Jan. 26, 1935	Week ended Jan. 27, 1934
East South Central States:								
Kentucky	14	18	156	7	621	68	4	0
Tennessee	21	16	805	141	96	772	9	3
Alabama [4]	21	42	1, 196	161	162	240	2	1
Mississippi [2]	2	9	-------	-------	-------	-------	0	0
West South Central States:								
Arkansas	10	7	69	25	18	461	2	1
Louisiana	29	26	12	20	81	41	0	0
Oklahoma [5]	8	34	187	89	82	580	5	2
Texas [4]	75	170	697	234	154	741	2	5
Mountain States:								
Montana	6	2	787	4	56	11	0	0
Idaho	-------	-------	7	1	29	45	0	0
Wyoming	-------	1	-------	-------	69	79	0	0
Colorado	8	5	-------	10	695	14	0	0
New Mexico	5	7	72	-------	61	133	4	0
Arizona	4	3	147	15	14	11	0	2
Utah [2]	-------	-------	-------	-------	10	777	0	0
Pacific States:								
Washington	-------	-------	-------	-------	94	425	2	0
Oregon	3	1	219	40	80	35	0	0
California	51	32	407	32	239	763	4	3
Total	797	980	9, 673	2, 201	15, 782	16, 895	96	49

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 26, 1935	Week ended Jan. 27, 1934	Week ended Jan. 26, 1935	Week ended Jan. 27, 1934	Week ended Jan. 26, 1935	Week ended Jan. 27, 1934	Week ended Jan. 26, 1935	Week ended Jan. 27, 1934
New England States:								
Maine	0	0	2	19	0	0	0	0
New Hampshire	0	0	11	26	0	0	0	0
Vermont	0	0	29	10	0	0	0	2
Massachusetts	1	1	153	265	0	0	1	0
Rhode Island	0	0	13	17	0	0	0	1
Connecticut	0	1	46	53	0	0	2	1
Middle Atlantic States:								
New York	0	2	666	715	0	0	3	5
New Jersey	1	0	129	201	0	0	0	8
Pennsylvania	1	1	602	775	0	0	6	15
East North Central States:								
Ohio	3	1	642	461	1	0	1	5
Indiana	0	0	211	181	2	3	0	0
Illinois	0	1	812	552	3	1	3	7
Michigan	0	0	343	463	1	0	3	4
Wisconsin	1	1	640	206	12	31	2	0
West North Central States:								
Minnesota	2	1	88	63	0	3	1	6
Iowa	0	0	73	102	1	4	2	2
Missouri	0	0	77	144	2	17	0	2
North Dakota	0	0	36	39	0	0	0	0
South Dakota	0	1	44	29	4	1	0	0
Nebraska	0	1	57	32	38	1	2	1
Kansas	1	0	78	156	7	1	2	4
South Atlantic States:								
Delaware	0	0	22	13	0	0	0	0
Maryland [3]	0	0	100	98	0	0	1	2
District of Columbia	1	0	29	18	0	0	0	0
Virginia	1	0	53	99	1	1	5	13
West Virginia	0	0	134	79	1	0	2	7
North Carolina	0	2	49	89	0	1	0	2
South Carolina	0	0	4	17	0	1	2	4
Georgia [3 4]	0	0	19	16	0	5	2	6
Florida	0	0	10	9	0	0	0	8

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 26, 1935, and Jan. 27, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 26, 1935	Week ended Jan. 27, 1934	Week ended Jan. 26, 1935	Week ended Jan. 27, 1934	Week ended Jan. 26, 1935	Week ended Jan. 27, 1934	Week ended Jan. 26, 1935	Week ended Jan. 27, 1934
East South Central States:								
Kentucky	0	1	51	74	0	0	1	3
Tennessee	0	1	41	55	0	0	1	9
Alabama [4]	2	1	16	24	3	0	2	11
Mississippi [3]	0	0	15	18	0	0	1	3
West South Central States:								
Arkansas	0	0	10	15	2	22	4	0
Louisiana	0	0	36	37	1	3	4	7
Oklahoma [5]	1	0	53	23	6	2	5	2
Texas [4]	1	0	110	104	2	14	14	11
Mountain States.								
Montana	0	0	28	25	2	0	1	2
Idaho	0	0	5	4	1	7	0	0
Wyoming	0	0	12	7	12	0	0	0
Colorado	0	0	240	38	2	1	1	0
New Mexico	0	0	23	71	0	0	3	13
Arizona	0	1	20	17	0	1	1	0
Utah [2]	0	0	72	13	0	0	0	0
Pacific States:								
Washington	1	2	59	52	49	4	1	2
Oregon	0	0	70	56	0	5	1	1
California	11	4	216	292	3	11	12	7
Total	28	23	6,249	5,872	156	140	98	171

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Dengue, week ended January 26, 1935, 8 cases in Georgia.
[4] Typhus fever, week ended January 26, 1935, 7 cases, as follows: Georgia, 3; Alabama, 2; Texas, 2.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December 1934										
Alabama	8	135	738	290	475	58	1	109	7	32
Arizona	2	12	152	2	137		1	153	0	20
Colorado	5	34			1,423		0	806	3	1
Idaho	1	1	44		27		0	14	2	5
Iowa	4	36	66		3,081		2	246	9	14
Kansas	8	45	22		1,314		2	379	9	8
Louisiana	3	123	38	106	67	8	4	83	5	53
Maryland		71	302		317	3	1	448	0	17
Mississippi		44	5,203	1,446	166	202		78	4	20
Montana	12	32	51		272		2	99	2	3
New York	16	205		3	2,896		9	1,929	0	45
Oklahoma [1]	3	70	553	34	11	14	2	205	3	49
Oregon	2	4	214		84		6	278	6	6
Pennsylvania	14	506			4,600		7	2,461	0	99
Puerto Rico		53	102	2,093	42		2	1	0	11
Virginia	8	238	734	3	836	11	2	487	16	44
Washington	4	16	192		290		16	194	170	7

[1] Exclusive of Oklahoma City and Tulsa.

December 1934

	Cases
Anthrax:	
Pennsylvania	1
Botulism:	
New York	3
Washington	1
Chicken pox:	
Alabama	248
Arizona	114
Colorado	371
Idaho	55
Iowa	476
Kansas	723
Louisiana	71
Maryland	610
Mississippi	616
Montana	164
New York	3, 241
Oklahoma [1]	91
Oregon	203
Pennsylvania	5, 469
Puerto Rico	43
Virginia	359
Washington	528
Conjunctivitis:	
Arizona	3
Dengue:	
Alabama	23
Mississippi	1
Dysentery:	
Alabama (amoebic)	1
Arizona	7
Kansas (amoebic)	1
Louisiana (amoebic)	7
Louisiana (bacillary)	3
Maryland	6
Mississippi (amoebic)	58
New York (amoebic)	7
New York (bacillary)	39
Oklahoma [1]	18
Pennsylvania	2
Puerto Rico	21
Washington	2
Dysentery and diarrhea:	
Virginia	45
Epidemic encephalitis:	
Iowa	2
Kansas	3
Louisiana	2
Oklahoma [1]	1
Oregon	2
Pennsylvania	2
Virginia	3
Washington	1
Filariasis:	
Puerto Rico	3
Food poisoning:	
Kansas	1
German measles:	
Arizona	11
Iowa	55
Kansas	177
Maryland	11
Montana	663
New York	466
Pennsylvania	136
Washington	133
Hookworm disease:	
Louisiana	3
Mississippi	219
Impetigo contagiosa:	
Colorado	10
Idaho	1

December 1934—Con.

	Cases
Impetigo contagiosa—Con.	
Iowa	1
Kansas	7
Maryland	60
Montana	8
Oklahoma [1]	1
Oregon	46
Leprosy:	
Louisiana	1
Mumps:	
Alabama	77
Arizona	21
Colorado	53
Idaho	3
Iowa	342
Kansas	201
Louisiana	2
Maryland	46
Mississippi	206
Montana	173
Oklahoma [1]	25
Oregon	314
Pennsylvania	2, 108
Puerto Rico	49
Virginia	83
Washington	153
Ophthalmia neonatorum:	
Alabama	2
Maryland	1
New York	10
Oklahoma [1]	1
Pennsylvania	15
Puerto Rico	1
Virginia	1
Washington	1
Paratyphoid fever:	
Idaho	4
New York	1
Oregon	1
Virginia	2
Washington	2
Puerperal septicemia:	
Mississippi	16
Puerto Rico	3
Rabies in animals:	
Alabama	64
Kansas	1
Louisiana	10
Maryland	5
New York [2]	1
Washington	11
Rabies in man:	
Louisiana	1
Pennsylvania	1
Relapsing fever:	
Arizona	1
Scabies:	
Kansas	1
Montana	9
Oklahoma [1]	2
Oregon	37
Septic sore throat:	
Colorado	1
Idaho	1
Iowa	1
Kansas	12
Louisiana	8
Maryland	11
Montana	22
New York	26
Oklahoma [1]	29
Virginia	6

December 1934—Con.

	Cases
Tetanus:	
Alabama	3
Kansas	1
Louisiana	4
New York	3
Oklahoma [1]	1
Puerto Rico	5
Virginia	3
Tetanus, infantile:	
Puerto Rico	4
Trachoma:	
Alabama	2
Arizona	43
Mississippi	3
Oklahoma [1]	3
Puerto Rico	3
Trichinosis:	
New York	29
Tularaemia:	
Iowa	1
Kansas	12
Louisiana	5
Maryland	25
Oklahoma [1]	1
Pennsylvania	1
Virginia	19
Typhus fever:	
Alabama	22
Louisiana	3
Maryland	1
New York	1
Undulant fever:	
Alabama	3
Arizona	1
Idaho	1
Iowa	7
Kansas	5
Louisiana	3
Maryland	3
New York	30
Pennsylvania	9
Virginia	4
Vincent's infection:	
Colorado	1
Idaho	1
Iowa	1
Kansas	1
Maryland	11
Montana	2
New York [2]	62
Oklahoma [1]	2
Oregon	27
Whooping cough:	
Alabama	207
Arizona	103
Colorado	46
Idaho	12
Iowa	59
Kansas	194
Louisiana	22
Maryland	174
Mississippi	501
Montana	42
New York	2, 875
Oklahoma [1]	25
Oregon	83
Pennsylvania	2, 359
Puerto Rico	319
Virginia	445
Washington	47

[1] Exclusive of Oklahoma City and Tulsa.
[2] Exclusive of New York City.

WEEKLY REPORTS FROM CITIES

City reports for week ended Jan. 19, 1935

[This table summarizes the reports received
showing a cross section of the c
Weekly reports are received fro

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	1	5	1	0	0	0	11	30
New Hampshire:											
Concord	0	------	0	0	0	1	0	1	0	0	13
Nashua	4	------	------	0	------	2	0	------	------	3	------
Vermont:											
Barre	------	------	------	------	------	------	------	------	------	------	------
Burlington	0	------	0	0	0	9	0	0	0	0	7
Massachusetts:											
Boston	5	------	4	5	32	33	0	8	1	44	230
Fall River	1	------	0	205	3	3	0	0	0	3	22
Springfield	0	------	0	13	3	7	0	0	0	6	38
Worcester	0	------	0	3	11	10	0	1	0	7	57
Rhode Island:											
Pawtucket	0	------	0	0	0	2	0	0	0	0	14
Providence	4	------	0	1	7	12	0	4	0	5	63
Connecticut:											
Bridgeport	0	------	2	0	4	5	0	2	0	0	41
Hartford	2	------	0	136	4	9	0	5	0	11	35
New Haven	0	6	1	34	6	1	0	1	0	0	57
New York:											
Buffalo	0	------	1	53	26	75	0	0	0	30	140
New York	31	29	13	122	171	266	0	90	5	274	1,607
Rochester	0	------	1	91	4	18	0	1	0	25	65
Syracuse	0	------	0	0	4	5	0	0	0	27	51
New Jersey:											
Camden	3	------	3	0	4	6	0	3	0	1	41
Newark	1	18	0	7	13	8	0	4	1	38	100
Trenton	0	4	2	20	2	17	0	3	0	8	46
Pennsylvania:											
Philadelphia	6	19	12	8	52	95	0	23	0	155	555
Pittsburgh	4	17	5	83	26	31	0	3	0	23	177
Reading	0	------	0	2	1	17	0	3	0	5	29
Scranton	1	------	------	54	------	2	0	------	0	5	------
Ohio:											
Cincinnati	5	------	7	2	29	32	0	10	0	3	172
Cleveland	10	149	10	37	30	41	0	12	0	36	241
Columbus	4	6	6	53	11	39	0	6	0	5	99
Toledo	0	2	2	27	10	12	0	3	0	25	79
Indiana:											
Fort Wayne	1	------	2	3	2	6	0	2	0	0	29
Indianapolis	5	------	5	2	14	17	0	2	0	3	------
South Bend	0	------	0	42	7	0	0	0	0	2	21
Terre Haute	0	------	0	0	0	0	0	0	0	0	17
Illinois:											
Chicago	4	20	10	156	88	355	0	33	2	57	737
Springfield	------	------	------	------	------	------	------	------	------	------	------
Michigan:											
Detroit	4	37	4	67	40	87	0	21	0	32	318
Flint	4	------	1	33	8	11	0	1	0	3	28
Grand Rapids	0	------	0	19	3	13	0	1	0	10	50
Wisconsin:											
Kenosha	0	------	0	47	0	20	0	0	0	21	11
Madison	0	------	------	9	------	1	0	------	0	0	6
Milwaukee	0	6	1	137	12	346	0	2	0	65	109
Racine	0	1	1	0	0	7	0	0	0	1	13
Superior	0	------	2	17	0	0	0	0	1	0	10
Minnesota:											
Duluth	0	------	0	170	3	0	0	0	0	0	34
Minneapolis	4	------	0	871	12	27	0	2	0	11	104
St. Paul	1	1	1	18	16	12	1	4	0	14	87
Iowa:											
Davenport	0	------	------	16	------	2	0	------	0	0	------
Des Moines	0	------	------	14	------	10	0	------	0	0	47
Sioux City	1	------	------	7	------	0	0	------	0	3	------
Waterloo	2	------	------	39	------	4	0	------	0	2	------

City reports for week ended Jan. 19, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Missouri:											
Kansas City	1	------	0	7	19	12	0	5	0	0	119
St. Joseph	6	------	1	0	6	1	0	3	1	0	32
St. Louis	18	4	1	9	29	12	0	11	0	8	250
North Dakota:											
Fargo	0	------	0	------	2	5	0	0	0	6	11
Grand Forks	0	------	------	5	------	3	0	------	0	0	------
South Dakota:											
Aberdeen	0	------	------	7	------	0	0	------	0	0	------
Sioux Falls	1	------	0	4	3	4	0	1	0	2	27
Nebraska:											
Omaha	0	------	1	2	13	13	0	0	0	0	50
Kansas:											
Topeka	0	------	0	4	7	5	1	0	0	9	17
Wichita	1	------	0	17	6	1	0	0	1	0	23
Delaware:											
Wilmington	0	------	0	1	3	1	0	0	0	0	22
Maryland:											
Baltimore	2	49	12	5	41	36	0	18	0	27	200
Cumberland	0	------	0	12	1	3	0	1	0	0	10
Frederick	0	------	0	0	0	0	0	0	0	0	3
District of Columbia:											
Washington	12	14	4	4	33	25	0	18	2	4	177
Virginia:											
Lynchburg	1	------	1	132	2	4	0	1	0	2	9
Norfolk	1	------	0	4	3	4	0	1	0	2	27
Richmond	0	------	3	67	15	4	0	5	2	0	68
Roanoke	2	------	2	6	2	4	0	0	0	2	27
West Virginia:											
Charleston	1	2	1	29	3	3	0	1	0	1	18
Huntington	3	------	------	3	------	3	0	------	0	0	------
Wheeling	0	1	1	5	3	19	0.	1	0	0	21
North Carolina:											
Raleigh	1	------	0	7	1	2	0	1	0	0	18
Wilmington	0	------	0	2	1	0	0	0	0	1	7
Winston-Salem	6	1	0	0	5	4	0	1	0	24	20
South Carolina:											
Charleston	0	126	2	1	4	0	0	0	0	1	19
Columbia	0	0	------	0	10	0	0	0	0	0	44
Greenville	0	------	0	0	6	0	0	1	0	0	28
Georgia:											
Atlanta	2	144	9	0	17	4	0	5	0	8	111
Brunswick	0	------	0	0	2	0	0	0	0	0	2
Savannah	0	202	10	0	6	4	0	4	0	0	37
Florida:											
Miami	0	1	0	1	1	1	0	1	0	4	------
Tampa	3	1	1	0	2	0	0	0	0	0	30
Kentucky:											
Ashland	0	------	------	1	------	0	0	------	0	3	------
Lexington	2	------	0	0	1	2	0	2	0	3	23
Louisville	3	8	3	16	12	10	0	2	0	5	70
Tennessee:											
Memphis	2	------	3	1	22	8	0	4	0	1	104
Nashville	3	------	3	0	8	1	0	2	0	8	42
Alabama:											
Birmingham	1	69	2	3	11	7	0	6	0	1	66
Mobile	1	------	2	0	3	0	0	1	0	0	33
Montgomery	0	------	------	7	------	0	0	------	0	0	------
Arkansas:											
Fort Smith	1	------	------	0	------	1	0	------	0	3	------
Little Rock	3	------	1	1	7	0	0	2	0	0	10
Louisiana:											
New Orleans	25	1	1	2	18	9	0	11	2	0	155
Shreveport	1	------	0	25	4	0	0	3	0	0	28
Oklahoma:											
Oklahoma City	1	------	0	0	10	0	0	0	1	0	47
Tulsa	1	------	------	0	------	3	0	------	0	5	------
Texas:											
Dallas	14	2	2	1	11	2	0	3	1	0	67
Fort Worth	4	------	0	0	2	2	0	4	0	0	31
Galveston	1	------	0	0	3	1	0	1	0	0	20
Houston	16	------	1	0	11	7	0	5	0	0	78
San Antonio	0	------	5	0	3	1	0	4	0	0	51

City reports for week ended Jan. 19, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Montana:											
Billings	2	------	------	6	------	1	0	------	0	0	10
Great Falls	0	------	0	------	3	1	0	0	0	2	13
Helena	0	------	0	34	0	0	0	0	0	0	6
Missoula	0	10	0	------	1	0	0	0	0	1	1
Idaho:											
Boise	------	------	------	------	------	------	------	------	------	------	------
Colorado:											
Denver	4	51	6	330	14	154	1	6	0	1	95
Pueblo	0	------	1	6	1	4	0	0	0	2	7
New Mexico:											
Albuquerque	1	------	4	3	5	2	0	5	0	3	23
Utah:											
Salt Lake City	0	------	3	6	3	60	0	2	0	40	38
Nevada:											
Reno	0	1	1	0	1	1	0	0	0	0	7
Washington:											
Seattle	0	------	1	6	8	5	3	4	0	3	83
Spokane	0	3	3	50	7	3	0	1	1	0	40
Tacoma	0	------	0	1	0	3	15	1	0	0	25
Oregon:											
Salem	0	2	------	0	------	0	5	------	0	0	------
California:											
Los Angeles	21	161	2	10	28	64	9	10	0	11	382
Sacramento	1	1	0	0	5	3	0	2	1	0	27
San Francisco	1	2	2	1	17	25	0	9	1	18	188

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts:			
Boston	1	0	0
Connecticut:			
Bridgeport	1	1	0
New York:			
New York	5	3	0
Pennsylvania:			
Philadelphia	3	1	0
Ohio:			
Cincinnati	9	3	0
Cleveland	0	0	1
Indiana:			
Indianapolis	3	0	0
Illinois:			
Chicago	5	2	0
Wisconsin:			
Milwaukee	2	0	0
Minnesota:			
St. Paul	0	0	1
Iowa:			
Des Moines	1	0	0
Missouri:			
St. Joseph	3	1	0
St. Louis	1	1	0

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Kansas:			
Wichita	0	1	0
Maryland:			
Baltimore	3	0	0
District of Columbia:			
Washington	1	0	0
South Carolina:			
Greenville	0	1	0
Kentucky:			
Louisville	0	1	0
Tennessee:			
Memphis	5	1	0
Arkansas:			
Little Rock	2	0	0
Louisiana:			
New Orleans	1	0	1
Oklahoma:			
Oklahoma City	2	1	0
Texas:			
San Antonio	0	1	0
Washington:			
Seattle	1	0	2
California:			
Los Angeles	0	0	2
Sacramento	0	0	1

Dengue.—Cases: Miami, 2.

Epidemic encephalitis.—Cases: Springfield, Mass., 1; Bridgeport, 1; New York, 2; Columbus, 1; Chicago, 1; Memphis, 1; St. Louis, 2; Birmingham, 1; New Orleans, 2; Albuquerque, 2.

Pellagra.—Cases: Savannah, 1; Dallas, 1.

Typhus fever.—Cases: Baltimore, 1; Charleston, S. C., 2; Atlanta, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended January 12, 1935.—During the 2 weeks ended January 12, 1935, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis		1		2		1			1	5
Chicken pox				425	507	126	100	31	140	1,419
Diphtheria	1	11	3	43	16	20	12	4		110
Dysentery				1	2					3
Erysipelas				19	4	5	2	1	5	36
Influenza		10		7	48	7			91	163
Lethargic encephalitis								1		1
Measles		90	5	615	550	1,208	841	9	75	• 3,393
Mumps					285	24		5	42	356
Paratyphoid fever					1					1
Pneumonia		3			10		5		34	52
Poliomyelitis					2			1	1	4
Scarlet fever	1	13	8	294	184	63	32	28	57	680
Tuberculosis		2	12	104	54	27	48	2	26	275
Typhoid fever		2		38	3	16		1		60
Undulant fever					3		2			5
Whooping cough		5		223	170	16	23	2	51	490

CUBA

Habana—Communicable diseases—4 weeks ended January 19, 1935.—During the 4 weeks ended January 19, 1935, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	4	3	Scarlet fever	1	
Malaria	[1] 31	7	Tuberculosis	20	4
Poliomyelitis	1	1	Typhoid fever	[1] 14	5

[1] Includes imported cases.

Provinces—Notifiable diseases—4 weeks ended January 12, 1935.—During the 4 weeks ended January 12, 1935, cases of certain notifiable diseases were reported in the Provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	1		1	7	1		10
Chicken pox		5			1	2	8
Diphtheria		3	2	1			6
Hookworm disease				1			1
Leprosy				1		3	4
Malaria	419	50	526	1,576	748	1,846	5,165
Measles		29		8		3	40
Poliomyelitis	4		1			2	7
Scarlet fever		1					1
Tuberculosis	5	9	28	45	9	22	118
Typhoid fever	2	4	6	25	15	10	62

CZECHOSLOVAKIA

Communicable diseases—November 1934.—During the month of November 1934, certain communicable diseases were reported in Czechoslovakia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	2	1	Paratyphoid fever	11	1
Cerebrospinal meningitis	1		Poliomyelitis	3	
Chicken pox	431		Puerperal fever	38	13
Diphtheria	5,220	306	Scarlet fever	3,504	23
Dysentery	199	55	Trachoma	129	
Influenza	42	4	Typhoid fever	810	68
Malaria	36				

ITALY

Communicable diseases—4 weeks ended June 24, 1934.—During the 4 weeks ended June 24, 1934, certain communicable diseases were reported in Italy as follows:

Disease	May 28–June 3		June 4–10		June 11–17		June 18–24	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	8	8	23	23	22	19	16	15
Cerebrospinal meningitis	12	11	12	11	5	3	9	8
Chicken pox	323	126	245	117	232	109	233	108
Diphtheria and croup	353	197	387	208	349	177	323	169
Dysentery	18	9	19	16	14	12	19	15
Lethargic encephalitis	4	4	1	1	1	1		
Measles	2,416	370	2,359	400	2,046	410	2,085	387
Poliomyelitis	16	15	25	22	37	26	22	16
Scarlet fever	230	103	251	99	213	85	193	84
Typhoid fever	248	166	344	220	367	229	443	264

VIRGIN ISLANDS

Notifiable diseases—October-December 1934.—During the months of October, November, and December 1934, cases of certain notifiable diseases were reported in the Virgin Islands, as follows:

Disease	October	November	December	Disease	October	November	December
Chicken pox		1		Pellagra		1	
Filariasis	4	3	4	Sprue		1	
Gonorrhea	8	5	3	Syphilis	7	12	4
Leprosy	2		10	Tetanus	1	2	
Malaria		14	6	Tuberculosis	3	1	2

YUGOSLAVIA

Communicable diseases—December 1934.—During the month of December 1934, certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	38	2	Poliomyelitis		1
Cerebrospinal meningitis	7	1	Scarlet fever	425	4
Diphtheria and croup	1,337	148	Sepsis	11	6
Dysentery	38	6	Tetanus	18	4
Erysipelas	207	9	Typhoid fever	786	88
Measles	3,210	92	Typhus fever	17	
Paratyphoid fever	15	1			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Jan. 25, 1935, pp. 115–129. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Feb. 22, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

India.—Cholera has been reported in India as follows: On December 17, 1934, cholera was reported present in Porto Novo, Madras Presidency. On January 19, 1935, one case of cholera was reported in Tuticorin, India.

Plague

Ecuador—Loja Province—Amaluza—Correction.—The Ecuador authorities have withdrawn the diagnosis of plague in the case reported in Amaluza, Province of Loja, as published on page 93 of the PUBLIC HEALTH REPORTS for January 18, 1935, and on page 117 of the PUBLIC HEALTH REPORTS for January 25, 1935.

India—Bombay.—During the week ended January 19, 1935, one case of plague was reported in Bombay, India.

Smallpox

Brazil—Recife.—During the week ended December 15, 1934, one case of smallpox was reported at Recife, Brazil.

Formosa—Keelung.—On January 10, 1935, an outbreak of smallpox was reported at Keelung, Formosa.

Somaliland (French)—Djibouti.—During the week ended January 19, 1935, five cases of smallpox were reported at Djibouti, French Somaliland.

Typhus fever

Chile.—According to a report dated January 8, 1935, typhus-fever control work has been abandoned in Chile because of lack of funds with which to continue the campaign. It was stated that practically no decrease had been noted recently in the number of cases of typhus fever in Santiago, the chief focal point of the epidemic.

Yellow fever

Gold Coast—Aperadi.—During the week ended January 19, 1935, one case of yellow fever was reported at Aperadi, Gold Coast.

Nigeria—Kano.—On December 31, 1934, one case of yellow fever was reported at Kano, Nigeria.

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UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES[1]

December 30, 1934–January 26, 1935

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of disease."

Influenza.—The number of cases of influenza reported for the 4 weeks ended January 26 was 34,610—approximately 25,000 more than for the preceding 4 weeks. Each geographic area contributed to the increase. The wave of influenza which started in the eastern half of the country spread into the west during the current period, but the indications thus far are that the epidemic is distinctly minor and that the cases are of a mild character. For the week ended February 2, 10,252 cases were reported—about 500 more than for the preceding week. The weekly number of cases fluctuated considerably, but it is apparent that the weekly peak incidence has been passed in several of the affected States. Considered in geographic sections (table 1), the New England and Middle Atlantic area has distinctly passed the peak of the cases. The other eastern sections are probably at or have just passed the peak, but in the West the rates were still rising appreciably in the week ended February 2, the latest period for which data are available at this writing.

Compared with recent years the current incidence for the entire reporting area was about 4 times that for the corresponding period last year and almost 5 times the incidence in 1932. In 1933 an epidemic was in progress at this time and the number of cases for the corresponding period of that year totaled 122,143.

Each geographic area reported an increase over last year and also over 1932. Table 1 shows by geographic sections the number of cases

[1] From the Office of Statistical Investigations, U. S Public Health Service. The numbers of States included for the various diseases are as follows: Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 47; diphtheria, 48; scarlet fever, 48; influenza, 44 States and New York City. The District of Columbia is counted as a State in these reports. These summaries include only the 8 important communicable diseases for which the Public Health Service receives regular weekly reports from the State health officers.

reported for recent weeks of this winter, with comparative figures for corresponding weeks in the three preceding winters.

TABLE 1.[1]—*Number of influenza cases reported in different geographic sections during recent weeks of the winter of 1934–35 and during corresponding weeks of the 3 preceding winters*

Year	Week ended—									
	Dec. 1	Dec. 8	Dec. 15	Dec. 22	Dec. 29	Jan. 5	Jan. 12	Jan. 19	Jan. 26	Feb. 2
Total:										
1934–35	1,068	1,046	1,671	2,438	3,975	6,965	10,023	7,749	9,673	10,252
1933–34	1,481	1,431	1,311	1,105	1,158	2,051	2,804	1,943	2,201	2,714
1932–33	14,291	26,144	37,770	48,624	62,323	64,318	40,057	24,663	14,839	10,880
1931–32	859	1,009	888	628	1,122	1,242	1,550	1,931	2,553	5,048
New England and Middle Atlantic:										
1934–35	82	103	132	396	519	641	622	288	123	144
1933–34	55	60	77	54	55	83	63	65	99	62
1932–33	54	65	101	263	1,080	2,127	3,131	2,375	1,521	1,669
1931–32	46	33	45	35	52	76	137	257	553	208
East North Central:										
1934–35	125	81	161	133	500	394	1,436	578	673	1,195
1933–34	246	100	194	110	204	143	250	163	106	301
1932–33	384	901	2,057	2,403	5,513	8,947	6,683	3,539	2,226	1,018
1931–32	29	147	28	51	106	89	180	106	199	194
West North Central:										
1934–35	73	56	120	105	117	556	442	725	530	626
1933–34	9	14	10	11	15	27	30	46	69	73
1932–33	182	170	272	[2] 1,586	[2] 8,930	[2] 4,313	[2] 4,234	3,655	1,177	1,045
1931–32	10	8	9	9	10	20	14	12	70	163
South Atlantic:										
1934–35	282	331	548	835	1,967	3,514	4,861	2,851	3,586	2,783
1933–34	673	689	511	547	403	1,102	809	926	1,088	1,211
1932–33	918	3,361	5,928	4,809	7,904	13,191	9,153	7,484	5,484	4,042
1931–32	540	530	507	322	540	608	577	6,521	708	743
East and West South Central:										
1934–35	420	358	597	856	713	1,558	1,859	2,038	3,122	3,150
1933–34	361	441	424	271	374	508	1,542	665	677	935
1932–33	6,231	18,489	25,358	31,912	27,713	27,720	13,094	4,909	2,945	1,954
1931–32	117	157	125	93	178	256	383	296	373	1,050
Mountain and Pacific:										
1934–35	86	117	113	113	159	302	803	1,269	1,639	2,354
1933–34	137	127	95	112	107	128	110	78	102	132
1932–33	6,522	3,158	4,054	7,651	11,183	8,020	3,762	2,701	1,486	1,132
1931–32	117	134	174	118	236	193	259	608	650	2,690

[1] A similar table appeared in the Public Health Reports for Jan. 18, 1935, p. 72.
[2] The following numbers of cases, not included here, were reported in Kansas in response to a special inquiry: Week ended Dec. 24, 1932, 78,624; Dec. 31, 27,779; Jan. 7, 1933, 7,923; Jan. 14, 2,027.

Measles.—There were 54,707 cases of measles reported for the current period—approximately 24,000 more than were reported for the preceding 4-week period. For the country as a whole the incidence was the highest for this period in recent years. A comparison of geographic areas, however, shows that the disease was most prevalent in the New England, Middle Atlantic, and North Central sections. The States in the East North Central area reported 13,758 cases for the current 4 weeks, which was more than 4 times the number reported for the corresponding period last year; the West North Central group reported 13,452 cases—almost 3 times last year's figure. The South Atlantic, South Central, and Mountain and Pacific regions each reported a decrease of about 50 percent from last year's figures.

Scarlet fever.—The scarlet fever incidence was slightly higher during the current period than for the corresponding period last year and more than 4,000 cases above the average for recent years. For the entire reporting area the number of cases totaled 24,469. The disease was most prevalent in the East North Central and Mountain sections. In the former area the number of cases (9,700) represented an increase of 50 percent over the corresponding period last year, while in the latter area the number of cases (1,443) was more than 5 times that of last year. Other areas closely approximated the incidence of recent years.

Typhoid fever.—The incidence of typhoid fever continued to decline. For the 4 weeks ended January 26 the number of cases reported was 629, slightly below the number reported for the corresponding period last year. For this period in 1933 and 1932 there were 735 and 923 cases, respectively. The disease was less prevalent than last year in all regions except the North Central, where it was slightly higher, and the New England and Middle Atlantic, where it was practically the same as last year.

Diphtheria—The number of cases of diphtheria (3,385) reported for the 4 weeks ended January 26 was about 80 percent of that for the corresponding period in each of the 2 preceding years and less than one-half of the number in 1932. Decreases in the various geographic areas ranged from 10 percent in the New England and Middle Atlantic to 40 percent in the South Central areas. In the East North Central and Mountain and Pacific regions the incidence closely approximated that of last year.

Meningococcus meningitis.—The number of cases of meningococcus meningitis increased more than 50 percent during the current 4 weeks over the preceding 4-week period. The number of cases (307) was also about 50 percent in excess of that for the corresponding period last year. For this period in 1933 and 1932 the numbers of cases were 262 and 314, respectively. All sections of the country contributed to the increase. In the West North Central and South Atlantic areas the current incidence was more than twice that for the corresponding period last year, and in other regions the increase ranged from 25 percent in the Middle Atlantic region to 50 percent in the East South Central section. States in the various areas reporting a large number of cases, in comparison with last year, were Ohio (34), Tennessee and Virginia (19 each), Kentucky (10), New Mexico (9), and Montana (7). In the New England and West South Central areas the incidence was about on a level with last year.

Poliomyelitis.—The incidence of poliomyelitis continued to decline through the month of January. For the 4 weeks ended January 26 118 cases were reported. This figure represented an increase of approximately 20 percent over last year's figure for the same period

and about 30 percent over the number of cases for the corresponding period in 1933. California, in the Pacific region, continued to report cases somewhat above the expectancy (52 for the current period as against 18 for this period last year), but other States in that region, as well as those in other areas, reported about the normal seasonal incidence.

Smallpox.—Increases in smallpox were reported from States in the Mountain, Pacific, West North Central, and South Atlantic regions. In the State of Washington the number of cases increased from 152 for the 4 weeks ended December 29, 1934, to 296 for the current period; in Wyoming, from 19 to 44; in Nebraska, from 53 to 98, and in West Virginia, from none to 14. The South Central areas reported practically the same incidence as that for the preceding period, and the East North Central States showed a 20 percent decrease.

The same States seemed mostly responsible for very significant increases in certain sections over the corresponding period last year, as well as more than 50 percent increase in the number of cases for the entire reporting area. For the 4 weeks ended January 26 there were 751 cases reported. For this period in 1933, 1932, and 1931 the cases totaled 642, 2,084, and 4,296, respectively.

Mortality, all causes.—The average mortality rate from all causes in large cities for the 4 weeks ended January 26, as reported by the Bureau of the Census, was 13.3 per 1,000 inhabitants (annual basis). For the corresponding period in the 3 preceding years the rate was 12.6, 13.1 and 12.3, respectively. The presence of the minor influenza epidemic, previously discussed, was no doubt responsible for the slightly higher rate; the peak rate of 14 occurred in the week ended January 12, 1935, with a rapid decline to 12.5 for the week ended January 26.

MOTTLED ENAMEL IN CATTLE

By H. Trendley Dean, *Dental Surgeon, United States Public Health Service*

During the past 20 years numerous articles reporting the development of human mottled enamel in various areas of the United States have appeared in the literature. The development of an analogous pathology in certain domestic animals has been largely overlooked. In this connection, therefore, the work (*1*) of North African investigators becomes of interest because of its important bearing on mottled enamel investigations.

LE DARMOUS

In various rock phosphate areas of North Africa, principally Algeria, Tunisia, and Morocco, a hypoplasia of the permanent teeth known as "le darmous" is endemic. These endemic areas apparently

have sharply defined geographical limits, and both human beings and certain domestic animals in the area are affected. Since sheep, cattle, and other animals affected with darmous were sold only with difficulty, the problem became one of considerable economic consequence. As a result, the subject was studied for a number of years at the Pasteur Institute in Algiers and the Research Laboratory of the Service of Animal Husbandry of Morocco.

Because of the large number of animals affected, the North African research has apparently been carried on solely by veterinary surgeons, such as, to mention a few, Velu, Balozet, and Claudon. The fact that le darmous likewise affects the human inhabitants of an endemic area has been noted by these workers. As the study advanced the epidemiology and the animal experiments revealed what is apparently the etiological factor. Velu (*2*) thereupon called the attention of the medical profession to its relation to the public health.

Velu (*1*) states that le darmous in the human being is a dental dystrophy endemic among the inhabitants of certain rock phosphate regions. He quotes from Claudon in describing the lesion found in the children, namely, that the modifications of the structure of the enamel are very constant, the teeth erupting through the mucosa being dull, rough, or uneven. After eruption the teeth change color, first to yellow and then to brown, the coloration extending by degrees and including in time even the cusps and incisal edges. These colorations are more frequently present on the incisors than on the molars.

In his epidemiological study Velu noted that if the children are removed from the influence of certain waters during the period of tooth formation the permanent teeth erupt showing normal structure. One illustration is a reference to the conditions prevailing in the village of Beni Meskine. There the children who accompany their sheep-herding parents each winter into the Chaouia are apparently free from le darmous, while those children of parents who remain at home throughout the year and drink continuously of the same water show the dystrophy in all of their teeth. This North African study suggested that le darmous was endemic only in the areas of natural phosphate deposits.

A series of animal experiments using both the white rat and the sheep conducted by Velu (*3*), and Velu and Balozet (*4*), indicated that le darmous was caused by the ingestion of small amounts of fluorine present as a fluoride in the drinking water as a result of its passage over or contact with the beds of natural phosphate. The latest report (*5*) of Velu suggests that, in some instances, le darmous may be developing as the result of using water obtained from deep-drilled wells. The particular well referred to is approximately 500 feet deep. It should be noted at this time that in the United States

mottled enamel is frequently found associated with the use of water from deep wells *(6)*.

The certainty that le darmous and mottled enamel are one and the same disease was inferred by the present writer in 1932 (*6*), concurred in independently by Velu (*7*) in 1933, and affirmed in 1934 by Munoz (*8*), in an article relating to "dientes veteados", the name by which mottled enamel is known in the Argentine.

MOTTLED ENAMEL IN CATTLE

The observation of mottled enamel in cattle in this country has been reported previously (*9*). During a survey in Horry County, S. C., mottled enamel was noted in the permanent teeth of certain dairy cows that drank continuously of artesian waters showing a high fluoride content. Two of the three waters associated with the mottled enamel in animals in this area were analyzed by Elvove (*10*) and found to contain 4.5 parts per million of fluorine. Water from the third well was not analyzed, but children of the household who had always used the same water showed a moderately severe type of mottled enamel. In all three of these instances the second laterals and corner teeth of the animals were more severely affected than the centrals and first laterals.

Chauveau (*11*) states that the permanent incisor teeth of the ruminants erupt as follows:

Teeth	Deciduous	Permanent
Centrals	Before or some days after birth	1½ years.
First laterals	do	2½ years.
Second laterals	14 days	3½ years.
Corners	2 to 3 weeks	4½ years.

During a recent survey in Texas, mottled enamel in cattle was again observed. Through the courtesy of E. W. Little, D. V. M., a dozen skulls of range cattle just slaughtered in an Amarillo abattoir were examined. Mottled enamel was definitely demonstrable on the incisor teeth of 4 of these specimens, 2 showing the white opaque type and 2 the brown stain, the latter a form of mottled enamel rather common among persons in Amarillo and the adjacent territory to the south and west. In all of these four specimens, the second laterals and corner teeth were apparently more severely affected than the earlier erupted teeth.

DISCUSSION

The observations of mottled enamel in cattle referred to naturally raise two important questions. First: Is the phenomenon noted in North Africa (*5*) with respect to its effect on growth in weight also

FIGURE 1.—Human mottled enamel. (Moderate with brown stain.)

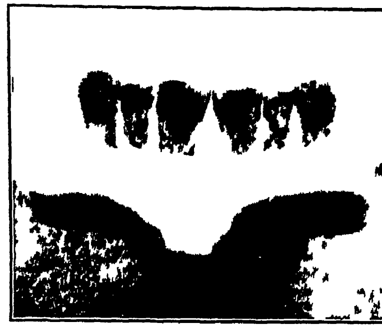

FIGURE 2.—Human mottled enamel. (Courtesy of Dr. C. D. Wofford, Plainview, Tex.)

FIGURE 3.—Le darmous in cattle as reported by Velu in North Africa. (Arch. Inst. Past. Algiers, Vol. X, No. 1, March 1932.)

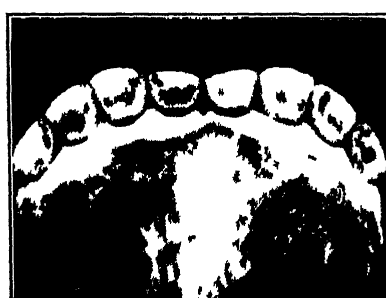

FIGURE 4.—Bovine mottled enamel, with brown stain apparently developed near Amarillo, Tex.

operative in cattle in such range country as the Panhandle and West Texas? Among the human inhabitants of this region mottled enamel is endemic over a wide area. Both the human beings and stock are largely dependent on water from drilled wells. Based on the wide-spread distribution of mottled enamel among the people of this section, it appears that stock have few water supplies available that are free of toxic amounts of fluorides.

The second question that naturally arises is: Would the continued ingestion by dairy cows of waters containing appreciable amounts of fluorides result in a milk with a high fluoride content? This question should be thoroughly investigated because of its possible relation to an increased intake of fluorides by the growing child in an endemic area. Experiments on cattle in which the fluoride is incorporated in the ration are not comparable to conditions producing mottled enamel in the human beings. Mottled enamel, in the light of present knowledge, is a water-borne disease, and the experimental approach should simulate this condition. Experiments (*12*) (*13*) conducted by the United States Public Health Service have shown, at least with respect to white rats, that a given concentration of sodium fluoride in the drinking water produced a more toxic reaction than the same concentration of sodium fluoride in the diet.

SUMMARY

1. An additional area, West Texas, showing mottled enamel in cattle is reported.

2. The economic consequence of a wide-spread fluorosis in stock may be a problem of some significance in animal husbandry.

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THE FAMILY SURVEY AS A METHOD OF STUDYING RURAL HEALTH PROBLEMS [1]

Brunswick-Greensville Health Administration Studies No. 3

By Elliott H. Pennell, *Assistant Statistician, United States Public Health Service*

In a recent paper by Mountin [2] the plan adopted by the Office of Studies of Public Health Methods for the analysis of rural health work was described. Certain subjects dealing with county health problems logically presented themselves. These subjects were indicated for special study, and they may be listed as follows:

1. Health problems of people in representative counties;
2. Quality and quantity of service performed by county health departments;
3. Relationship of county health department service to health problems of the people; and
4. Effect of health department service on individual health problems.

According to the paper referred to, the first subject is being studied with the aid of an actual canvass of families, the second will make use of an analysis of the records of the work of the health department personnel, the third will require a comparison of the conditions determined from the family canvass with those revealed by the analysis of health department records, and the fourth will depend upon specially designed studies of specific activities of the health department.

One of the activities of the Office of Studies of Public Health Methods is the development of plans of study which may be adopted

[1] From the Office of Studies of Public Health Methods in cooperation with Division of Domestic Quarantine.

[2] Mountin, Joseph W.: Effectiveness and economy of county health department practice. Pub. Health Rep., vol. 49, no. 42, Oct. 19, 1934.

and used by local administrators in their endeavor to increase the effectiveness of their own programs through a better understanding of the problems with which they have to deal. As numerous requests have been received for assistance in planning surveys of rural families for various purposes, it has appeared desirable to describe in some detail the survey methods developed by the office and used in the rural areas selected. Particular reference is made to the collection of data by the method of canvassing carefully selected samples of families and the subsequent analysis of the data so collected.

The material to be discussed in this paper may be conveniently classified under five heads:

1. Type of family data sought;
2. Schedule used in family survey;
3. Selection of the families to be surveyed;
4. Method of conducting the surveys; and
5. Representativeness of the survey data.

TYPE OF FAMILY DATA SOUGHT

It might be thought that a comprehensive picture of family problems and service might be obtained from health department records and information compiled by other agencies. However, when such data are examined it becomes apparent that many of the required comparisons cannot be made, because the records were not so designed.

The program of a health department presumably deals with the problems arising from the area it serves, through contact with the individuals, the families, and the homes in which they live. To analyze the work of the health department from the point of view of its quality, effectiveness, and adequacy requires some picture of the population as a whole, in respect of such items as the age, sex, and color of the individuals, the size and distribution of the families, the sanitation of the premises, and illnesses and needs for medical and nursing care in the families. At the same time, it is necessary to determine in a general way the nature of the problems requiring services of the various health department agencies, and how well these needs are being met.

The records of the work of the various members of the health department staff may indicate the extent and distribution of the services comprising the program and at the same time give the needs of the population as expressed in the demands made for service. But the problems of the area cannot be defined by an analysis of such records alone, because they do not provide information on those persons or families in need of service who have not come to the attention of the health department.

The work of the health officer is shown by an analysis of his records. Much of his time, however, is devoted to administrative and super-

visory functions, and the group of individuals and of families served directly by him are selected by the nature of the services his program is designed to provide. If emphasis is placed on inspections and immunizations of school children, the individuals seen will be largely in the school-age group, and the families receiving service will be those having children. Where clinics for medical treatment are a part of the health department program, the age group served will be influenced by the type of problem involved; for example, a large venereal-disease or maternity clinic will bring about contacts with many adults, while infancy and preschool clinics serve other particular age groups.

The nurse may provide a generalized type of service, but her work may be weighted by one or more special activities. In home visits, the nurse considers the family as a whole, but she is likely to center her attention around some problem associated with, for example, communicable disease, tuberculosis, infancy, or maternity. While the service in homes represents the response by the nurse to needs within the family, the individuals receiving such service are only persons who present problems. Family data, however completely it may be obtained for such a group, cannot represent families of all types in the area.

Inspection of premises makes up a large part of the sanitation officer's work. His program may be a general one, including supervision of dairies, food-dispensing establishments, control of private water-supply and excreta-disposal facilities, or it may be confined almost exclusively to some special problem such as privy sanitation; the emphasis, however, is always on the premises, with descriptive data for the family being quite secondary.

If it were possible to relate all the service rendered by a health department to the home environment of the individuals receiving it, the result would not be a cross-section of all elements in the area. But it is not possible from the usual administrative records which are available to determine the home environment of the persons served. Where school work is a responsibility of the health department, many of the contacts of the health officer and the public health nurse are through group activities in the schools. Such activities involve the weighing and measuring of children, inspections for communicable disease, and immunizations; and the usual health department record made for such services indicates only the number of children seen, the date, and the type of service rendered. In the sanitation work, where the problem is largely one of improvement of the sanitary condition of the premises, records provide little more than a statement as to the nature of the problem which was the object of the visit, the name of the owner or occupant, and the location of the home.

Thus it may be seen that an analysis of the records of the work of the various members of the health department cannot give a picture of the population residing in the area.

Some description of the population is given by the United States census figures. The tabulations for county areas show the distribution of the population according to age, sex, color, and minor civil division of residence. Certain data on the size of the families, sources of income, and types of farms are also available. These data give a general picture of the area, but they cannot be related to the health department services received by the family to show the relationship of service to need. Such a procedure requires that information be gathered simultaneously concerning the population, its problems, and the services rendered.

To obtain such data requires special study, and the family survey was selected as the method to secure them. By going to the home, first hand data are obtained from the families as to their home environment, the problems they might have presented, and any services they might have received.

Because of the prohibitive expense, it is obviously impracticable to interview all the families in the area. This factor of expense, however, does not necessitate discarding the survey method, since it is reasonable to postulate that a sample of families properly selected and adequate in size might give essentially the facts that would be obtained from a complete census, and at only a small fraction of the cost.

The method of survey requiring the canvassing of selected families of adequate number has been adopted, and, in fact, has not only been used with success in Brunswick and Greensville Counties in southern Virginia, but is now being applied in Fairfax County, Va., in Montgomery County, Md., and in the rural part of Forsyth County, N. C.

The surveys now being conducted have been under the direct supervision of the writer from the outset, while the Office of Statistical Investigations of the United States Public Health Service provided the necessary supervision in the Brunswick-Greensville area. The discussion of the method of selecting the families and the manner of conducting the surveys is based on the three surveys now being made, but the plan follows closely the procedure previously adopted for the first area.

SCHEDULE USED IN THE FAMILY SURVEY

To insure the collection and recording of comparable data, a thoughtfully devised schedule is required. It is of paramount importance that the schedule be carefully made and that particular attention be directed to the matter of completeness, and to the exclusion of extraneous items and expressions of an ambiguous nature. It

[illegible] Race____ Serial Number____

Address____ Township or District____ Vil____ or O. C.____

House: Owned____ Rented____ Number of rooms____ Heat____ Light____

Ice box____

Refrigeration: Spring or well____ Radio____ Telephone____ Automobiles Number____ Make____ Year____

Occupation of Household Head:____

Economic Status Comfortable____ Moderate____ Poor____ Very Poor____ Total family income for past year $____

Source of Income Father____ Mother____ Other____

Work Relief Type____ Amount____

Other Relief: Food____ Clothing____ Medical____ Agencies supplying same____

Sanitary Conditions: General Cleanliness: Good____ Fair____ Poor____

Water Supply: City supply____ Well____ Spring____ Cistern____ Other____

Excreta Disposal: City Sewer____ Private Cesspool or Septic Tank____ Privy____ None____

Screening of Home: Fly Proof____ Partly Screened____ None____

Milk Supply: Amount used daily____ qts. Home produced____ Bought____ Canned____ Raw____ Past.____

Grade of Milk: A____ B____ Does milk supply come from tuberculosis tested cows?____

Garden: For own use____ sells produce also____ cans vegetables for winter use____

Magazines kept regularly____ Newspapers Daily____ Weekly____

Public health literature read during year: Subject____ Received from____

Public health meetings attended during year: Number____ Place____ Lecturer____

P. H. Classes. Type____ Place____ Instructor____

Family physician____ Address____ Family D D S____ Address____

Notes____

Date schedule was taken____ Informant's No.____ ____ Surveyor

[illegible]

FIGURE 1.—Schedule used by the field canvassers (Front).

Ind Number	Name	Sex	Relation	Date of Birth	Presence in Home: In	Presence in Home: Out	Died During Past 12 Mos: Date	Died During Past 12 Mos: Cause	Ind No	Type of Illness or Other Reason for Medical, Dental or Nursing Care	Duration in Days: Bed	Duration in Days: Dis.	Amount and Place of Service: Hos. Days	Visits to: Home	Visits to: Cl.	Visits to: Off	Type of Medical Attent.	Type of Nursing Attent.	Days of Nurs. Serv	Reason for No Medical Service
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				
13																				
14																				
15																				
16																				

Services Obtained from the Health Department Past 12 Months

Individual Numbers	Personnel: H O	P H N	S I	D.D.S	[illegible]	Clerk	Place of Contact: Home	Off	Sch.	Other	No. of Visits	Purpose of Visit	Service Rendered or Recommendations Made by Health Dept. Personnel	Rec. Followed	Outcome

Dis. History Ind No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Diphtheria																
Scarlet																
Measles																
Whooping Cough																

Immunizations Ind. No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Diphtheria																
Smallpox																
Typhoid																
Other																
Schick Tests																

FIGURE 2.—Schedule used in the field canvass of families (Back).

is important also that the canvasser be instructed to enter a definite statement for every item; should the information be unknown for a particular item, the fact that it is unknown should be so stated, since a blank space following an item is meaningless.

The survey form used is shown in figures 1 and 2. One side of the schedule, figure 1, includes the descriptive items for the family and for the premises where they lived at the time they were interviewed. The entries in the first two lines identify the family by name, color, and location of the home. The number of rooms is noted, and such matters as the type of light and heat used, and whether or not the family had a radio, telephone, or automobile are recorded as an index of economic status. The occupation of the household head, all income to the family, and relief received from any source are noted. The source of water supply and the type of excreta disposal are checked for each home, as well as data on screening, milk supply, and gardens. In addition, an attempt is made to obtain a list of magazines read, of health department literature received, and of health meetings or classes attended.

The reverse side of the form, figure 2, provides for recording the name, sex, relation to the household head, and date of birth for each person who was in the household at any time during the year preceding the visit. Space is provided for recording all illnesses causing confinement to bed or inability to pursue the usual activities, together with any type of service received from a doctor, nurse, or other private attendant, or from any health department representative. For each illness recorded, there is space to enter the number of days in a hospital; the number of visits to or by a medical attendant in the home, office, or clinic, and the number of days of nursing care. Where there was an illness without medical attendance, the family is questioned as to why no doctor was consulted. For each individual having any contact with the health officer, sanitation officer, or public health nurse, an entry is made to show who was seen, the place where the contacts were made, the number and purpose of the visits, the services rendered, and any recommendations that were made. Communicable disease and immunization histories are obtained for each individual in the household.

SELECTION OF THE FAMILIES TO BE SURVEYED

From past experience, about 10 percent of a population may be considered a sufficient sample to provide reasonably adequate information on any but the unusual and infrequent situations, but it is desirable that not less than 900 or 1,000 families be interviewed. A smaller group than this does not provide sufficient numbers to permit of subdivision and comparison within the sample. Such a sample, to be representative of the area from which it is drawn, however, must

obviously include all the essential elements of the population in proportions at least roughly equivalent to the percentages of those elements in the total population.

Before the selection was made, the available census figures for a county were examined, and the approximate number of white and colored families required to make up a sample of the desired size was determined for the minor civil divisions and for the incorporated towns and villages; homes on certain streets or blocks of streets were chosen to represent that particular type of community home. In addition, numerous sections were outlined on the map that included, for the different rural areas, families representative of their social, economic, and environmental status The size and location of these rural sections were adjusted to give a proper proportion of f milies living in small crossroad settlements, along improved highways, and on isolated farm premises.

METHOD OF CONDUCTING THE SURVEYS

In securing social data of any type, it is quite necessary that people be employed who have some familiarity with the data they are to get and who are capable of eliciting proper response on the part of the person interviewed. Field workers were secured who possessed such qualifications and who had worked for several months in this or in associated offices on studies based on data from family survey schedules, and were therefore familiar with the problems which arise in the classification of such data. Another consideration, perhaps equally important, was the preparation of a clear, concise set of written instructions and definitions of all items on the schedule, for the guidance of the field workers.

To insure as uniform an approach as possible, a person was secured who had a background of several years' experience in going to homes and obtaining family data. After the schedule, instructions, definitions, and general objectives of the survey were explained, a series of families were interviewed, and a systematic order of questioning was decided upon which seemed best adapted for obtaining the information sought. Instructions or definitions which proved difficult to interpret were clarified at this time. The field canvassers were sent into the field with this person for a preliminary training period of several days before being assigned to an area.

Throughout the surveys, daily reports are sent to the central office, and all schedules are collected and examined at regular intervals. Any incomplete or inconsistent record is returned to the canvasser for correction. As new questions arise, they are submitted to the person in charge for final decisions, who informs all workers of the procedure to be followed when similar situations arise in their work.

Before leaving one area for another the worker is required to have seen every family in that area and to have obtained either a completed schedule or a refusal. It might be said that refusals are met with in only a small fraction of 1 percent of all the families interviewed.

REPRESENTATIVENESS OF THE SURVEY DATA

After the surveys are completed, the data are coded and punched on cards for mechanical tabulation. This has been done for the Brunswick-Greensville County records, and the discussion which follows will be based on tabulations from that survey. It illustrates

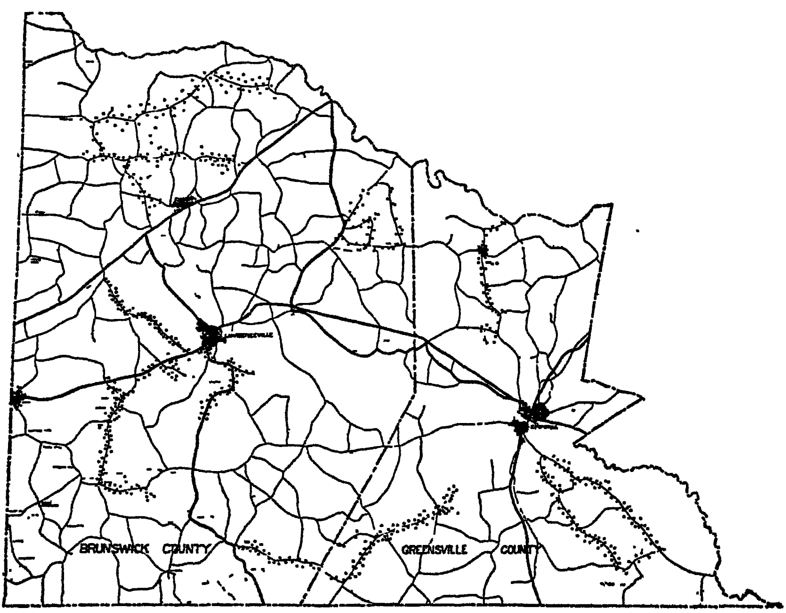

FIGURE 3.—Distribution of the 1,009 families residing in the representative areas selected in Brunswick and Greensville Counties who were interviewed by the field canvassers.

the checks on the reliability of the method and its utility for defining the health problems in a rural area.

Figure 3 shows a map of Brunswick and Greensville Counties, Va., each dot representing a family from whom data were obtained.

In table 1, comparative figures from the 1930 United States census and from the surveyed group of families in Brunswick and Greensville Counties are given. Approximately 15 percent of all the families and 17 percent of all individuals in the 2 counties were included. In the 1930 census, the families and the population were subdivided into rural-farm and rural-nonfarm on the basis of replies to a question reading, "Does this family live on a farm?" In the sample of families, the classification was based on the principal source of income, the group of farm families including only those residing in the

country and considering the farm as their principal source of income. Assuming that the two classifications are roughly comparable, it may be seen that 11 percent of the farm families and 22 percent of the nonfarm families were interviewed. The percentages of the individuals in each of these groups who were included in the sample were 13 and 26, respectively. It was necessary to get a high percentage of Lawrenceville and Emporia families to insure a sample of town families large enough for comparison with those living in isolated homes; this accounts for the higher percentage of nonfarm homes included in the sample. While there was some lapse in time between the census and the survey, it seems improbable that this could render the data incomparable.

TABLE 1.—*Percentage of the farm group, the nonfarm group, and the total population included in the surveyed sample of families in Brunswick and Greensville Counties*

	Families			Persons		
	United States Census 1930, total	Surveyed sample		United States Census 1930, total	Surveyed sample	
		Number	Percent of total		Number	Percent of total
Farm group	4,501	507	11.3	24,388	3,174	13.0
Nonfarm group	2,232	502	22.5	9,486	2,456	25.9
Total	6,733	1,009	15.0	33,874	5,630	16.6

The surveyed sample included approximately 17 percent of the total population in the area and about the same percentage in each of the two counties as is shown in table 2. A slightly higher percentage of the white than the colored was included, there being 18 percent of the former and 15 percent of the latter. In Brunswick County practically the same percentage of white and colored families was interviewed, about 17 percent, but in Greensville County, 21 percent of the white, as compared with 14 percent of the colored, were included.

TABLE 2.—*Percentage of the white and colored population included in the surveyed sample of families in Brunswick and Greensville Counties*

	White			Colored			White and colored		
	United States Census total	Surveyed sample		United States Census total	Surveyed sample		United States Census total	Surveyed sample	
		Number	Percent of total		Number	Percent of total		Number	Percent of total
Brunswick County	8,994	1,531	17.0	11,492	1,891	16.5	20,486	3,422	16.7
Greensville County	5,259	1,083	20.6	8,129	1,125	13.8	13,388	2,208	16.5
Total	14,253	2,614	18.3	19,621	3,016	15.4	33,874	5,630	16.6

The age distribution of the white and colored population in the two counties in 1930 and as shown by the surveyed group of families is given in table 3. The census indicates a slightly higher proportion of children under 10 years of age, but the difference is of a low order of significance.

TABLE 3.—*Distribution of the white and colored population in Brunswick and Greensville Counties according to the 1930 United States census and as found in the surveyed sample of families*

Age group	United States census				Surveyed sample			
	White		Colored		White		Colored	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Under 1	295	2.1	511	2.6	62	2.4	87	2.9
1-4	1,283	9.0	2,203	11.2	221	8.5	313	10.5
5-9	1,766	12.4	3,172	16.2	287	11.0	424	14.3
10-14	1,799	12.5	2,847	14.5	323	12.4	445	15.0
15-19	1,600	11.2	2,512	12.8	309	11.9	411	13.8
20-24	1,196	8.4	1,515	7.7	243	9.3	288	9.7
25-29	955	6.6	1,116	5.7	182	7.0	162	5.4
30-34	885	6.2	841	4.3	162	6.2	140	4.7
35-44	1,630	11.4	1,821	9.3	295	11.3	252	8.5
45-54	1,355	9.5	1,559	7.9	238	9.1	219	7.4
55-64	883	6.2	861	4.4	174	6.7	132	4.4
65-74	484	3.4	477	2.4	71	2.7	66	2.2
75 and over	161	1.1	183	0.9	37	1.4	36	1.2
Total of known age	14,292		19,618		2,604		2,975	

Table 4 shows the distribution of the families in the two counties by size, according to the United States census and as found in the sample of families. In 1930, 4.7 percent of the total families had but one individual, and 15.9 percent were two-individual families; whereas, the sample included but 1.7 percent of the former and 12 percent of the latter. The most frequent size of family was three individuals in both the census distribution and the surveyed group. The median size was 4.4 in the former and 4.9 in the latter. In the census count, the family unit included only related persons living together; whereas, in the sample the household was the unit and included all persons living together under the same roof and eating at the same table. While this may account in part for the difference noted, there seems to have been a real selection of larger families. The average size of family for the census population and for the sampled families was 5.0 and 5.6, respectively.

Aside from a deficiency of small families and the relatively high percentage of village homes, the distribution of the population in the sample of families is remarkably similar to that of the total for the counties as shown by the United States census tabulations.

TABLE 4.—*Distribution of families in the total area and in the surveyed sample classified according to the number of individuals in the household*

Number of individuals in the household	1930 United States census		Surveyed sample	
	Number	Percent	Number	Percent
1	315	4.7	17	1.7
2	1,072	15.9	121	12.0
3	1,129	16.8	163	16.2
4	964	14.3	154	15.3
5	836	12.4	137	13.6
6	678	10.1	140	13.9
7	577	8.6	79	7.8
8	438	6.5	81	8.0
9	301	4.5	49	4.9
10	209	3.1	27	2.7
11	102	1.5	24	2.4
12 or more	112	1.7	17	1.7
Total	6,733		1,009	

Apart from the survey of families, studies are being made which involve the collection of records of the work done by the health department over a period of several months. In Brunswick and Greensville Counties this study of the work of the health department personnel was begun shortly before the survey had been completed. The analysis of these records is now being made, and the work of the sanitation officer has been described in a recent paper of this series.[3] Certain of the findings may be compared with the service reported by the families, and such data are introduced here as another test of the representativeness of information obtained in this way. If it may be assumed that the work of such an official does not vary in content to any marked degree from one year to the next, a comparison of the distribution of services rendered by the sanitation officer, as disclosed by the health department records, with that reported by the families should indicate roughly the completeness with which such data were obtained by the canvass. The description of the work of the sanitation officer was based on a 6-month period, while the sample covered 12 months of service. The percentages of the sampled homes reporting service were therefore divided by 2 to give figures which might be compared to those from the health-department records. While the description of the sanitation work in the area shows that return visits were made to many homes, this comparison should indicate roughly the completeness with which service was reported to the canvassers.

In table 5 are given certain percentages for household premises visited during a 6-month period as estimated from the survey of homes and as given in the description of the sanitation officer's work.

[3] Dean, J. O., and Mountain, J. W.: Job analysis of a rural sanitation officer, Pub. Health Rep., Vol. 49, No. 51, Dec. 21, 1934.

TABLE 5.—*Percentages of certain groups of homes in Brunswick and Greensville Counties receiving service from the sanitation officer in a 6-month period as estimated from a survey of homes and as obtained from a study of health-department records*

Source of data	Percentage of homes seen by the sanitation officer in a 6-month period						
	Total homes in area	Brunswick County homes	Greensville County homes	White homes	Colored homes	Town and village homes	Isolated homes
Survey of homes	19	15	26	17	22	21	18
Health department records	21	14	32	17	25	38	18

It brings out that in a period of approximately 6 months the sanitation officer went to about 21 percent of the homes in the two counties, inspecting 14 percent of the premises in Brunswick and 32 percent of those in Greensville County. The corresponding percentages obtained from the surveyed sample of families are remarkably similar. The 15 percent found in Brunswick County was practically the same as was shown by the health department records while the 26 percent for Greensville was low.

Both the figures obtained from the health department records and from the survey indicate that the sanitation program emphasized work in the colored homes. Figures from the survey showed that 17 percent of the white and 22 percent of the colored homes were inspected, as compared with the 17 percent and 25 percent, respectively, obtained from the records. Further analysis of the survey data, however, indicates that the work of the sanitation officer was confined largely to homes where privy inspection was needed, practically no visits being made to the large number of homes in the two county seats provided with city water and sewerage. The higher percentage of colored homes receiving service is probably due to the fact that the work of the sanitation officer was confined chiefly to privy sanitation in the towns and villages, and the colored homes in these locations depended almost entirely upon privies for disposal of excreta, whereas many white families had municipal sewerage.

In the surveyed group the percentage of town and village families reporting inspections was 21, as against 38 percent of such families recorded by the sanitation officer. It has previously been noted that a relatively high proportion of the homes in the county seats were included to give a sample of this type of home large enough to compare with isolated homes. The sewer connections were confined to the two county seats, so that this undue weighting of the sample with these homes included many where the sanitation officer would not visit. Other data from the survey indicate that a high percentage of the white families living in the villages other than the county seats reported service from the sanitation officer.

As this paper is meant chiefly to illustrate a method of study that may be useful in appraising the health problems in a rural area, the analysis of the data secured is reserved for later papers. After the limitations of the sample are determined by checks against available figures, the data may serve as a guide for the revision of health-department programs. In the case of the work of the sanitation officer, it makes available data concerning the premises of a cross-section of the population in the area he serves. It points out the type of home where no service is rendered, and describes the facilities for excreta disposal and water supply as found on a group of premises which may serve well to suggest new fields of activity. The adequacy of a nursing program with respect to such problems as communicable diseases and maternity and infancy cases may be revealed by the frequency with which such items are reported where medical and nursing supervision were inadequate or lacking. The economic status and family environment of the homes where such problems appear should in general disclose whether the problem is one of failure to appreciate the need for service or inability to provide it.

In the three counties now being surveyed, the collection of records on the various members of the health department staff has preceded the survey of families. This will give, for the same chronological 12-month period, reports by families of service received and a record of all health department work for the same households. In this way it will be possible to check services given to individuals in the surveyed samples against those reported as received by the families. Such an analysis will afford an index of the reliability of the reports of the families on the various types of service and will, at the same time, make possible the allocation of actual health department records of service to a group of individuals and families whose home environment is known. Such a procedure will make available a complete picture of services rendered by the health department to a group of families representing a cross-section of the whole area.

PUBLIC HEALTH SERVICE PUBLICATIONS

A List of Publications Issued During the Period July–December 1934

There is printed herewith a list of publications of the United States Public Health Service issued during the period July–December 1934.

The most important articles that appear each week in the Public Health Reports are reprinted in pamphlet form, making possible a wider and more economical distribution of information that is of especial value and interest to public-health workers and the general public.

All of the publications listed below except those marked with an asterisk (*) are available for free distribution and as long as the sup-

ply lasts may be obtained by addressing the Surgeon General, United States Public Health Service, Washington, D. C. Those publications marked with an asterisk are not available for free distribution but, unless stated to be "out of print", may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., *at the prices noted.* (No remittances should be sent to the Public Health Service.)

Periodicals

Public Health Reports (weekly), July–December, vol. 49, nos. 27–52, pages 782 to 1599.

Venereal Disease Information (monthly), July–December, vol. XV, nos. 7–12, pages 233 to 407.

Reprints from the Public Health Reports

1633. Effectiveness of filtration in removing from water, and of chlorine in killing, the causative organism of amoebic dysentery. By Bertha Kaplan Spector, John R. Baylis, and Oscar Gullans. July 6, 1934. 16 pages.
1634. Time distribution of common colds and its relation to corresponding weather conditions. By Mary Gover, Lowell J. Reed, and Selwyn D. Collins. July 13, 1934. 14 pages.
1635. Electrocution a new aid in the preparation of mosquito mounts. By C. P. Coogle. July 13, 1934. 3 pages.
1636. Pulmonary infection in pneumoconiosis. I. Bacteriologic and experimental study. By H. O. Proske and R. R. Sayers. July 20, 1934. 20 pages.
1637. Milk-sanitation ratings of cities. Cities for which milk-sanitation ratings of 90 percent or more were reported by the State milk-sanitation authorities during the period July 1, 1932, to June 30, 1934. July 27, 1934. 4 pages.
1638. Studies in chemotherapy. I. The action of sodium formaldehyde sulphoxylate in bacterial infections. By Sanford M. Rosenthal. August 3, 1934. 4 pages.
1639. Heart disease among seamen. By H. Arenberg. August 3, 1934. 9 pages.
1640. Effect on the eye of the yellow light of the sodium vapor lamp. By James E. Ives. August 10, 1934. 9 pages.
1641. Public Health Service publications. A list of publications issued during the period January–June 1934. August 10, 1934. 4 pages.
1642. A review of the Federal civil works projects of the Public Health Service. By C. E. Waller, August 17, 1934. 8 pages.
1643. Tendencies in standards of river and lake cleanliness. By H. W. Streeter. August 24, 1934. 12 pages.
1644. Recent court decisions on milk control. By James A. Tobey. August 24, 1934. 6 pages.
1645. Maximum temperatures and increased death rates in the drought area in 1934. By Selwyn D. Collins and Mary Gover. August 31, 1934.
1646. Child health activities in a State department of health. By Estella Ford Warner. September 7, 1934. 5 pages.
1647. Effect of various amounts of sodium fluoride on the teeth of white rats. By H. Trendley Dean, W. H. Sebrell, R. P. Breaux, and E. Elvove. September 14, 1934. 7 pages.

1648. Mortality rates by occupational class in the United States. By Rollo H. Britten. September 21, 1934. 11 pages.
1649. Whole-time county health officers, 1934. September 28, 1934. 9 pages.
1650. Some findings of the N. O. P. H. N. survey of public health nursing of significance to State health administrators. By Pearl McIver. September 14, 1934. 10 pages.
1651. Experimental studies of natural purification in polluted waters. IX. Nitrification in sewage mixtures. By Emery J. Theriault and Paul D. McNamee. October 5, 1934. 7 pages.
1652. The actual causes of dermatitis attributed to socks. By Louis Schwartz. October 5, 1934. 10 pages; 2 plates.
1653. Sickness among male industrial employees during the second quarter and the first half of 1934. By Dean K. Brundage. October 19, 1934. 4 pages.
1654. Effectiveness and economy of county health department practice. Brunswick-Greensville health administration studies no. 1. Description of study. By Joseph W. Mountin. October 19, 1934. 10 pages.
1655. The Chicago epidemic of amoebic dysentery in 1933. By Herman N. Bundesen. October 26, 1934. 7 pages.
1656. The relation between housing and health. By Rollo H. Britten. November 2, 1934. 13 pages.
1657. The National Leprosarium, Carville, La. Review of the more important activities during the fiscal year ended June 30, 1934. By. O. E. Denney. November 16, 1934. 7 pages.
1658. Streptococcus bacteriophage: A study of four serological types. By Alice C. Evans. November 23, 1934. 16 pages.
1659. What every person should know about milk. By Leslie C. Frank. December 14, 1934. 11 pages.
1660. Further studies on growth and the economic depression. A comparison of weight and weight increments of elementary-school children in 1921-27 and in 1933-34. By Carroll E. Palmer. December 7, 1934. 17 pages.
1661. Extent of rural health service in the United States, January 1, 1930–December 31, 1933. December 7, 1934. 16 pages.
1662. The distribution of immunity against encephalitis virus of the St. Louis type in the United States as determined by the serum-protection test in white mice. By J. G. Wooley and Charles Armstrong. December 14, 1934. 11 pages.
1663. Job analysis of a rural sanitation officer. Brunswick-Greensville health administration studies no. 2. By J. O. Dean and Joseph W. Mountin. December 21, 1934. 14 pages.
1664. The official United States and international unit for standardizing gas-gangrene antitoxin (vibrion septique). By Ida A. Bengtson. December 28, 1934. 13 pages.

Supplements to the Public Health Reports

111. Citations to public health laws and regulations, 1931. 1934. 32 pages.
112. The notifiable diseases. Prevalence in States, 1933. 1934. 12 pages.

Reprint from Venereal Disease Information

48. Lymphogranuloma inguinale. By Leroy E. Burney. Vol. XV, no. 7. 11 pages.

Public Health Bulletins

211. Studies in asphyxia. I. Neuropathology resulting from comparatively rapid carbon-monoxide asphyxia. II. Neuropathology resulting from comparatively slow carbon-monoxide asphyxia. III. Neuropathology resulting from comparatively slow carbon-monoxide asphyxia; reaction during 16 to 165 days after exposure. IV. Neuropathology resulting from comparatively rapid asphyxia by atmospheres deficient in oxygen. V. Blood chemistry changes resulting from comparatively rapid asphyxia by atmospheres deficient in oxygen. VI. Blood chemistry of dogs after comparatively rapid carbon-monoxide asphyxia. By W. P. Yant, John Chornyak, H. H. Schrenk, F. A. Patty, and R. R. Sayers. August 1934. 61 pages.
212. Leprosy. Observations on its epidemiology in Hawaii. By N. E. Wayson and Theodore R. Rhea. September 1934. 32 pages.
213. Epidemiological study of plague in the Hawaiian Islands. By C. R. Eskey. October 1934. 70 pages.

Annual Report

*Annual report of the Surgeon General of the United States Public Health Service for the fiscal year 1934. 143 pages.

Unnumbered Publications

Index to Public Health Reports, vol. 49, part 1 (January–June 1934). 1934. 24 pages.

COURT DECISION ON PUBLIC HEALTH

Salary of county health officer.—(New Mexico Supreme Court; *State Bureau of Public Health et al.* v. *Board of Com'rs of San Miguel County*, 38 P.(2d) 1111; decided December 6, 1934). Doctor Howe had served as health officer of San Miguel County for several years at a salary of $150 per month. On August 1, 1931, he resigned after the county commissioners had adopted a budget for the fiscal year beginning July 1, 1931, which provided that the health officer's salary should be $300 per annum. This salary was raised to $600 on July 7, 1931, by the tax commission. Doctor Fleming was then appointed as health officer by the county commissioners, but his designation never received the approval of the State board of public welfare. On November 9, 1931, the State director of public health, with the approval of the State board of public welfare, appointed Doctor Kaser as health officer, and, having paid him at the rate of $150 per month for several months, the State health authority sued to recover the amount from the county. In the trial court recovery was had on the basis that the salary properly payable was $50 per month, and an appeal was taken to the supreme court.

The plaintiff relied on the provision that the State health authority, in case of vacancy, should appoint a health officer "at a compensation not to exceed the compensation paid to the previous incumbent."

The supreme court pointed out that the lower court had refused "to find that the former incumbent, Doctor Howe, 'was drawing a salary of $150 per month at the date of his said resignation' and refused to find that 'the appointment of Doctor Kaser was at the same salary as the previous incumbent.'" In affirming the trial court's judgment the appellate court said:

The rulings are supported by the theories that the making of the estimate by the county board on June 22, 1931, was in legal effect a fixing of the compensation for the ensuing fiscal years; that the same took effect July 1, 1931, subjec' to change by the tax commission; that Doctor Howe's legal salary, beginning July 1st, was as thus tentatively fixed; and that it became $50 per month when the tax commission, on July 7th, having raised the item to that figure, approved the budget.

DEATHS DURING WEEK ENDED JAN. 26, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Jan. 26, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	8,973	8,757
Deaths per 1,000 population, annual basis	12.5	12.2
Deaths under 1 year of age	541	568
Deaths under 1 year of age per 1,000 estimated live births	50	52
Deaths per 1,000 population, annual basis, first 4 weeks of year	13.3	12.6
Data from industrial insurance companies:		
Policies in force	67,084,807	67,571,562
Number of death claims	14,612	14,695
Death claims per 1,000 policies in force, annual rate	11.4	11.3
Death claims per 1,000 policies, first 4 weeks of year, annual rate	11.0	11.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Feb. 2, 1935, and Feb. 3, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 2, 1935, and Feb. 3, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 2, 1935	Week ended Feb. 3, 1934	Week ended Feb. 2, 1935	Week ended Feb. 3, 1934	Week ended Feb. 2, 1935	Week ended Feb. 3, 1934	Week ended Feb. 2, 1935	Week ended Feb. 3, 1934
New England States:								
Maine	2	2	1	1	100	1	0	1
New Hampshire	--------	--------	--------	--------	3	228	0	0
Vermont	--------	--------	--------	--------	25	26	0	0
Massachusetts	5	12	--------	--------	360	2,228	1	2
Rhode Island	2	1	--------	1	34	2	0	0
Connecticut	7	8	80	4	558	34	0	1
Middle Atlantic States:								
New York	49	55	[1] 28	[1] 24	1,091	717	5	3
New Jersey	15	27	35	32	156	223	3	1
Pennsylvania	36	100	--------	--------	2,126	1,743	6	3
East North Central States:								
Ohio	77	63	324	121	775	383	12	1
Indiana	41	40	125	88	383	702	0	2
Illinois	46	33	146	17	2,020	337	9	9
Michigan	7	12	61	2	463	43	1	0
Wisconsin	6	6	539	73	965	808	3	2
West North Central States:								
Minnesota	4	8	3	--------	2,222	164	1	0
Iowa	11	12	61	15	1,132	49	2	0
Missouri	39	51	463	15	468	1,120	13	2
North Dakota	1	2	31	5	83	130	0	0
South Dakota	2	1	--------	--------	--------	579	1	0
Nebraska	11	15	20	35	274	88	5	0
Kansas	8	7	48	3	981	52	1	1
South Atlantic States:								
Delaware	1	4	--------	--------	2	213	0	0
Maryland [2 3]	7	12	323	28	43	174	0	1
District of Columbia	7	13	4	1	7	215	[4] 8	0
Virginia	22	33	--------	--------	657	675	11	4
West Virginia	12	26	289	101	359	33	1	0
North Carolina [3]	5	31	303	68	750	2,926	3	2
South Carolina	11	9	1,176	808	40	377	0	0
Georgia [3 5]	8	21	581	--------	--------	938	0	3
Florida [3]	12	12	47	5	27	63	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 2, 1935, and Feb. 3, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 2, 1935	Week ended Feb. 3, 1934	Week ended Feb. 2, 1935	Week ended Feb. 3, 1934	Week ended Feb. 2, 1935	Week ended Feb. 3, 1934	Week ended Feb. 2, 1935	Week ended Feb. 3, 1934
East South Central States:								
Kentucky	27	51	195	42	384	159	4	1
Tennessee	17	11	396	126	25	806	12	2
Alabama	9	21	1,380	158	217	204	3	1
Mississippi [2]	7	16					0	1
West South Central States:								
Arkansas	5	14	148	38	14	473	4	0
Louisiana	36	17	24	10	279	33	1	0
Oklahoma [6]	17	38	263	109	69	393	1	1
Texas [3]	68	139	744	452	155	991	3	3
Mountain States:								
Montana		3	565	42	107	8	3	0
Idaho			7		29	97	1	0
Wyoming					65	51	2	0
Colorado	10	3			1,016	35	1	0
New Mexico	5	13	654	1	50	60	0	0
Arizona	2	1	250	18	17	21	0	1
Utah [2]	2	1	2		5	938	1	0
Pacific States:								
Washington	1	2	20		146	390	1	3
Oregon	1	1	291	26	82	51	1	0
California	56	39	565	45	267	1,129	3	5
Total	717	981	10,252	2,514	19,031	21,119	127	56

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 2, 1935	Week ended Feb. 3, 1934	Week ended Feb. 2, 1935	Week ended Feb. 3, 1934	Week ended Feb. 2, 1935	Week ended Feb. 3, 1934	Week ended Feb. 2, 1935	Week ended Feb. 3, 1934
New England States:								
Maine	0	1	18	18	0	0	1	2
New Hampshire	0	0	18	18	0	0	0	0
Vermont	0	0	25	20	0	0	0	0
Massachusetts	0	0	183	250	0	0	2	2
Rhode Island	0	0	15	15	0	0	0	0
Connecticut	0	0	46	68	0	0	0	0
Middle Atlantic States:								
New York	0	0	698	726	0	0	9	4
New Jersey	0	0	131	178	0	0	9	1
Pennsylvania	1	0	536	812	0	0	9	16
East North Central States:								
Ohio	1	1	927	823	1	0	1	8
Indiana	1	0	276	264	4	0	1	2
Illinois	1	2	918	493	4	3	6	6
Michigan	0	1	330	466	0	0	3	0
Wisconsin	0	0	606	183	18	35	5	2
West North Central States:								
Minnesota	0	0	129	67	4	3	2	0
Iowa	0	0	71	77	0	9	2	3
Missouri	0	1	70	165	1	10	4	1
North Dakota	0	0	75	40	0	0	0	0
South Dakota	0	0	12	18	2	0	0	0
Nebraska	0	0	63	36	49	1	0	0
Kansas	0	1	131	146	9	5	3	1
South Atlantic States:								
Delaware	0	0	16	19	0	0	0	0
Maryland [2] [3]	1	0	116	78	1	0	0	4
District of Columbia	1	0	22	14	0	0	1	0
Virginia	0	1	46	76	1	0	6	3
West Virginia	0	2	133	79	0	4	2	5
North Carolina [3]	2	0	31	76	0	0	2	0
South Carolina	0	0	8	8	0	0	2	4
Georgia [3] [5]	0	0	12	9	0	0	4	10
Florida [3]	0	0	5	7	0	0	4	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 2, 1935, and Feb. 3, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 2, 1935	Week ended Feb. 3, 1934	Week ended Feb. 2, 1935	Week ended Feb. 3, 1934	Week ended Feb. 2, 1935	Week ended Feb. 3, 1934	Week ended Feb. 2, 1935	Week ended Feb. 3, 1934
East South Central States:								
Kentucky	0	0	88	106	0	1	2	1
Tennessee	0	1	26	54	0	0	3	8
Alabama	0	0	19	20	1	0	4	4
Mississippi [2]	1	0	22	32	1	2	2	5
West South Central States:								
Arkansas	0	0	9	12	0	1	0	1
Louisiana	0	1	16	26	3	1	8	7
Oklahoma [6]	0	0	17	29	0	0	1	13
Texas [3]	2	0	89	145	7	17	17	17
Mountain States:								
Montana	0	0	64	25	3	0	1	1
Idaho	0	0	10	15	0	1	0	0
Wyoming	0	0	34	8	11	5	0	0
Colorado	0	1	233	43	5	11	1	0
New Mexico	0	0	24	34	0	0	3	3
Arizona	0	0	23	1	0	1	0	0
Utah [2]	0	0	89	7	0	1	0	0
Pacific States:								
Washington	1	1	53	46	59	0	4	3
Oregon	0	0	58	60	8	7	0	0
California	13	3	291	301	9	13	3	6
Total	25	17	6,832	6,213	201	131	127	144

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever; week ended Feb. 2, 1935, 14 cases, as follows: Maryland, 1; North Carolina, 1; Georgia, 8; Florida, 1; Texas, 3.
[4] Delayed reports included.
[5] Dengue, week ended Feb. 2, 1934, 1 case in Georgia.
[6] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December 1934										
Arkansas					35				16	
Nevada		6	47		18		0	18	0	2
Wisconsin	9	19	108		1,553		9	1,629	53	3

December 1934

	Cases
Chicken pox:	
Arkansas	120
Nevada	50
Wisconsin	2,788
Epidemic encephalitis:	
Wisconsin	1
German measles:	
Wisconsin	759
Mumps:	
Arkansas	11
Wisconsin	595
Ophthalmia neonatorum:	
Wisconsin	1
Trachoma:	
Wisconsin	1
Tularaemia:	
Wisconsin	5
Undulant fever:	
Arkansas	2
Whooping cough:	
Arkansas	53
Nevada	6
Wisconsin	694

WEEKLY REPORTS FROM CITIES

City reports for week ended Jan. 26, 1935

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	1	3	4	0	1	0	5	18
New Hampshire:											
Concord	0	------	0	0	3	1	0	0	0	0	10
Nashua	1	------	------	0	------	0	0	------	0	1	------
Vermont:											
Barre	------	------	------	------	------	------	------	------	------	------	------
Burlington	0	------	0	0	0	8	0	0	0	0	9
Massachusetts:											
Boston	1	------	1	9	26	39	0	5	1	38	265
Fall River	0	------	0	230	2	1	0	0	0	11	28
Springfield	0	------	0	24	3	3	0	1	1	3	29
Worcester	0	------	0	0	6	16	0	1	0	8	70
Rhode Island:											
Pawtucket	0	------	------	0	------	0	0	------	0	0	13
Providence	4	------	1	0	10	9	0	3	0	3	83
Connecticut:											
Bridgeport	0	3	1	0	6	10	0	1	0	0	35
Hartford	0	1	0	132	12	7	0	0	0	19	65
New Haven	0	9	0	38	1	1	0	0	0	0	30
New York:											
Buffalo	0	1	3	81	15	88	0	11	0	27	138
New York	36	17	10	110	172	305	0	88	1	217	1,570
Rochester	1	------	0	136	3	17	0	1	0	14	60
Syracuse	0	------	1	10	1	3	0	0	0	29	41
New Jersey:											
Camden	0	2	2	0	2	5	0	1	0	1	31
Newark	0	8	1	3	7	9	0	6	0	45	86
Trenton	1	1	0	29	2	12	0	3	0	6	36
Pennsylvania:											
Philadelphia	2	20	11	5	42	77	0	19	1	133	477
Pittsburgh	1	26	7	81	24	38	0	5	0	21	159
Reading	0	------	0	5	2	6	0	0	0	16	27
Scranton	0	------	------	101	------	1	0	------	0	0	------
Ohio:											
Cincinnati	7	------	9	2	20	18	0	1	0	7	145
Cleveland	6	96	4	71	22	35	0	7	0	29	213
Columbus	6	8	8	43	7	32	0	0	0	5	89
Toledo	1	3	2	42	6	15	0	9	0	10	72
Indiana:											
Fort Wayne	5	------	0	0	9	1	0	0	0	0	29
Indianapolis	1	------	2	2	16	23	0	5	0	5	------
South Bend	0	------	0	35	4	4	0	1	0	1	30
Terre Haute	1	------	0	0	5	1	0	0	0	0	12
Illinois:											
Chicago	13	11	5	234	70	362	0	39	0	73	746
Springfield	4	------	0	3	2	12	0	3	0	8	27
Michigan:											
Detroit	7	49	3	77	37	103	0	26	0	66	306
Flint	0	------	0	25	6	18	0	0	0	8	28
Grand Rapids	0	------	0	26	1	4	0	1	0	7	28
Wisconsin:											
Kenosha	0	------	0	68	0	32	0	0	0	18	2
Milwaukee	0	15	5	248	6	320	0	7	0	51	115
Racine	0	------	0	5	1	4	4	1	0	7	9
Superior	0	------	2	10	0	1	0	1	0	0	11
Minnesota:											
Duluth	0	------	1	174	4	1	0	0	0	0	28
Minneapolis	1	------	4	810	7	21	0	1	1	5	95
St. Paul	0	1	1	6	8	17	0	2	0	4	67
Iowa:											
Davenport	0	------	0	9	0	1	0	0	0	0	1
Des Moines	0	------	0	19	0	4	0	0	0	0	38
Sioux City	1	------	------	5	------	1	0	------	0	3	2
Waterloo	0	------	------	20	------	9	0	------	0	0	------
Missouri:											
Kansas City	1	1	1	22	18	7	0	4	0	6	126
St. Joseph	1	------	1	1	9	1	0	2	0	0	31
St. Louis	31	3	3	17	8	17	0	10	0	3	208

City reports for week ended Jan. 26, 1935—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
North Dakota:											
Fargo	0		0	0	0	3	0	0	0	0	5
Grand Forks	0			4		4	0		0	0	
South Dakota:											
Aberdeen	0			12		0	0		0	1	
Nebraska:											
Omaha	2		2	5	10	20	1	1	0	0	50
Kansas:											
Topeka	0		1	8	9	6	0	0	0	6	21
Wichita	1		0	34	4	5	0	1	0	1	33
Delaware:											
Wilmington	0		0	0	2	4	0	1	0	1	22
Maryland:											
Baltimore	3	50	8	14	34	53	0	19	0	27	257
Cumberland	0		0	24	2	3	0	0	0	0	6
Frederick	0		0	0	1	0	0	0	0	0	9
District of Col.:											
Washington	7	32	4	23	22	29	0	5	0	4	164
Virginia:											
Lynchburg	0		0	134	1	2	0	0	0	1	11
Norfolk	0	28	0	4	4	2	0	6	0	2	43
Richmond	0		1	35	6	5	0	7	1	0	59
Roanoke	2		1	11	1	2	0	0	0	0	13
West Virginia:											
Charleston	0		0	24	0	1	0	0	0	0	6
Huntington	0			4		3	0		0	0	
Wheeling	0	1	2	2	3	21	0	1	0	4	18
North Carolina:											
Raleigh	0		0	17	2	1	0	2	0	0	10
Wilmington	1	12	0	1	6	1	0	1	0	1	13
Winston-Salem	2	2	0	1	8	1	0	1	0	46	24
South Carolina:											
Charleston	0	85	4	0	2	2	0	1	0	0	22
Columbia	0		0	0	5	0	0	0	0	0	9
Greenville	1		0	0	2	0	0	1	0	2	12
Georgia:											
Atlanta	3	108	5	0	14	7	0	3	0	2	96
Brunswick	0		0	0	1	0	0	0	0	0	2
Savannah	0	76	2	0	7	0	0	2	0	2	45
Florida:											
Miami	0	1	1	0	3	0	0	3	0	1	40
Tampa											
Kentucky:											
Ashland	2	6		0		0	0		0	0	
Lexington	0	5	0	7	5	0	0	0	0	5	20
Tennessee:											
Memphis	2		8	1	11	10	0	4	0	2	88
Nashville	0		0	0	0	0	0	0	0	0	45
Alabama:											
Birmingham	2	110	3	8	9	2	0	1	0	2	58
Mobile	2	3	2	0	3	3	0	0	0	0	19
Montgomery	3	5	0	7		0	0		0	0	
Arkansas:											
Fort Smith	1			0		4	0		0	0	
Little Rock	4		0	1	1	1	0	0	0	0	4
Louisiana:											
New Orleans	15	9	6	10	16	9	0	12	3	0	155
Shreveport	2		0	25	5	3	0	3	0	1	37
Oklahoma:											
Oklahoma City	2		3	0	13	2	0	0	0	0	61
Tulsa	1			5		4	1		0	5	
Texas:											
Dallas	4	1	1	0	10	2	0	7	1	0	83
Fort Worth	2		3	0	8	1	1	5	0	0	45
Galveston	1		0	0	1	1	0	0	0	0	10
Houston	3		3	0	8	3	0	2	1	0	72
San Antonio	1		4	0	6	0	0	8	0	0	66
Montana:											
Billings	1		0	8	0	1	0	0	0	0	8
Great Falls	0		0	179	3	0	0	0	0	0	13
Helena	0		0	46	0	0	0	0	0	0	4
Missoula	0	15	0	0	0	0	0	0	0	1	8

City reports for week ended Jan. 26, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Idaho:											
Boise	------	------	------	------	------	------	------	------	------	------	------
Colorado:											
Denver	6	29	5	517	9	164	0	6	0	0	92
Pueblo	1	------	0	10	3	5	0	0	0	2	9
New Mexico:											
Albuquerque	0	------	3	17	6	2	0	4	0	9	26
Utah:											
Salt Lake City	0	------	4	3	6	55	0	0	0	30	38
Nevada:											
Reno	0	------	0	1	0	3	0	0	0	0	5
Washington:											
Seattle	------	------	------	------	------	------	------	------	------	------	------
Spokane	0	2	2	50	2	6	0	1	0	0	34
Tacoma	0	------	2	1	0	1	14	0	0	0	23
Oregon:											
Portland	0	5	0	38	5	22	0	2	0	0	85
Salem	0	8	------	0	------	0	0	------	0	0	------
California:											
Los Angeles	17	255	1	13	13	46	3	11	2	12	386
Sacramento	9	------	0	5	5	3	0	1	1	3	46
San Francisco	3	6	1	4	14	23	0	11	1	7	179

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts:			
Boston	0	1	0
New York:			
Buffalo	1	0	0
New York	4	0	0
Pennsylvania:			
Philadelphia	0	1	0
Pittsburgh	1	0	1
Ohio:			
Cincinnati	4	7	0
Indiana:			
Indianapolis	0	1	0
Illinois:			
Chicago	3	2	0
Michigan:			
Detroit	1	0	0
Wisconsin:			
Milwaukee	1	1	0
Minnesota:			
Minneapolis	0	0	1
Iowa:			
Sioux City	2	2	0
Missouri:			
St. Joseph	1	0	0
St. Louis	4	1	0

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
North Dakota:			
Fargo	1	0	0
Maryland			
Baltimore	1	1	0
District of Columbia:			
Washington	3	0	1
Georgia:			
Atlanta	1	1	0
Tennessee:			
Memphis	5	2	0
Nashville	0	2	0
Alabama:			
Montgomery	1	0	0
Arkansas:			
Little Rock	1	3	0
Oklahoma:			
Oklahoma City	1	0	0
Tulsa	1	0	0
New Mexico:			
Albuquerque	1	1	0
Oregon:			
Portland	0	1	1
California:			
Los Angeles	0	0	2
San Francisco	0	1	0

Dengue: Miami, 2 cases.
Epidemic encephalitis.—Cases: New York City, 2; St. Paul, 1; Portland, Oreg., 1.
Pellagra.—Cases: Boston, 1; Charleston, S. C., 1; Savannah, 1; San Francisco, 2.
Typhus fever: Savannah, 3 cases.

FOREIGN AND INSULAR

BRITISH WEST INDIES

Barbados—Measles.—On February 1, 1935, 2,000 cases of measles were unofficially reported in Barbados, British West Indies. The disease was said to be mild.

CUBA

Habana—Communicable diseases—1934.—During the year 1934, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	January-June		July-December		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Malaria	142	12	383	22	525	34
Poliomyelitis	-----	-----	101	15	101	15
Typhoid fever	99	32	154	40	253	72

NOTE.—The above figures include many imported cases.

GERMANY

Diphtheria.—According to a recent report, the incidence of diphtheria in Germany has been increasing during recent years. About 115,000 cases were reported during 1934, a morbidity rate of 17.3 per 10,000 population. In 1929 there were 7.9 cases of diphtheria reported in Germany per 10,000 population, 11 in 1930, 8.9 in 1931, 10.1 in 1932, and 11.5 in 1933. The mortality was said to be low.

ITALY

Communicable diseases—4 weeks ended July 22, 1934.—During the 4 weeks ended July 22, 1934, certain communicable diseases were reported in Italy as follows:

Disease	June 25-July 1		July 2-8		July 9-15		July 16-22	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	20	16	23	20	19	17	33	29
Cerebrospinal meningitis	9	9	11	9	9	8	16	14
Chicken pox	166	101	193	109	156	85	153	98
Diphtheria and croup	312	182	311	179	278	161	327	180
Dysentery	28	11	19	15	13	10	82	16
Lethargic encephalitis	6	6	2	2	3	3	-----	-----
Measles	1,853	372	1,907	406	1,615	336	1,621	360
Poliomyelitis	49	34	33	28	32	31	33	28
Scarlet fever	213	90	177	85	187	92	197	99
Typhoid fever	489	284	561	343	604	334	716	428

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Jan. 25, 1935, pp. 115–129. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Feb. 22, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Plague

Egypt—Girga.—On January 20, 1935, 1 case of plague with 1 death was reported at Girga, Egypt.

Smallpox

Colombia.—During the two weeks ended January 12, 1935, 11 cases of smallpox were reported in Colombia.

India—Cochin.—During the week ended January 19, 1935, two cases of smallpox were reported at Cochin, India.

Yellow fever

Colombia—Intendencia of Meta—Restrepo.—During the week ended January 5, 1935, one death from yellow fever was reported in Restrepo, Intendencia of Meta, Colombia.

Ivory Coast—Dimbokro.—During the week ended January 19, 1935, 1 case of yellow fever with 1 death was reported at Dimbokro, Ivory Coast.

Sierra Leone.—On January 12, 1935, one suspected case of yellow fever was reported at Hill Station in Sierra Leone.

108728°—35——3

UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg. Gen R. C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

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PUBLIC HEALTH REPORTS

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A GENERAL VIEW OF THE CAUSES OF ILLNESS AND DEATH AT SPECIFIC AGES[1]

Based on Records for 9,000 Families in 18 States Visited Periodically for 12 Months, 1928–1931

By SELWYN D. COLLINS, *Senior Statistician, United States Public Health Service*

CONTENTS

Mortality statistics are now collected by the registration method in nearly all civilized countries of the world. Detailed annual and special reports based on the registered deaths are available for the principal countries and for the various States of the United States. These data afford information on death rates for specific causes, at specific ages, for both males and females and in some countries for specific occupations, together with time trends. In contrast with this mass of complete information on mortality, there are no detailed data on the extent and causes of illness for any large population group in any country.

The scattered sources of sickness records were discussed in a preceding report (4); they may be summarized here with special reference to the availability of data for specific ages.

[1] From the Office of Statistical Investigations, U. S. Public Health Service.

This is the fourth of a series of papers on sickness and medical care in this group of families (4, 5, 6). The survey of these families was organized and conducted by the Committee on the Costs of Medical Care; the tabulation was done under a cooperative arrangement between the Committee and the Public Health Service. Committee publications based on the results deal primarily with costs and Public Health Service publications primarily with the incidence of illness and the extent and kind of medical care, without regard to cost. As costs are meaningless without some knowledge of the extent and nature of the service received, there is inevitably some overlapping. The Committee staff, particularly Dr. I. S. Falk and Miss Margaret Klem, cooperated in the tabulation of the data.

Special thanks are due to Dr. Mary Gover, who assisted in the analysis, to Miss Lily Vanzoe, who was in immediate charge of tabulating the data, to Drs. Amanda L. Stoughton and E. R. Jones for advice and assistance in classifying the causes of sickness and death, and to other members of the statistical staff of the Public Health Service for advice and assistance in the preparation of the study.

The tenth decennial census of the United States taken as of June 1, 1880, included an inquiry on the number of persons "so sick or disabled as to be unable to pursue their ordinary occupations" on the day of the enumeration. The tabulations were limited to persons over 15 years of age and to States where the data were thought to be complete. The census report devoted to vital statistics (3) includes rates by age and sex, based on a total of 20,000,000 persons over 15 years of age in 19 States. No data were published on the causes of illness, but the preponderance of chronic ailments is indicated by the rapid rise of sickness prevalence with age, as found by more recent surveys of sickness prevalence on the day of the canvass.

Similar inquiries were included in the Irish censuses of 1851, 1861, and 1871 and in the Australian census of 1881.

During the years 1915–17 the Metropolitan Life Insurance Co. surveyed families including half a million people (11) to determine the *prevalence of illness on a given day;* the results are published by cause for all ages and by age for all causes, and a few of the reports for individual localities show the numbers of cases of specific diagnoses in broad age groups.

Data on the *prevalence* of illness *on a given day,* such as those in the two sources quoted above, are quite different from data on the *incidence* of new cases that occur *over a period of time.* The prevalence data for a given day are heavily weighted by chronic illnesses, whereas data on incidence over a period of time are more largely made up of acute cases of shorter duration.

Among the sources of data on the incidence of illness are the rather incomplete reports of communicable diseases to local and State health departments. These reports afford data on this limited group of ailments for States and cities, but tabulations by age or in any classes except as total cases for each diagnosis are rarely published.

Records of illness among members of sick benefit associations (2) are available in specific diagnoses but not by age except insofar as the working span limits the individuals to the active working ages. In a few special studies of industrial employees (1) and of school children (7, 9, 10, 14), sickness rates are available by age for the limited age ranges covered.

The Hagerstown study (12) shows data classified by age, sex, and cause of illness and is the only one which affords a record of sickness *incidence over a period of time* for persons of different ages throughout the life span; this solitary record of the incidence of illness in the general population contrasts remarkably with the wealth of mortality data available.

SOURCE OF THE DATA

Illness.—The data included in the present paper are the results of periodic canvasses of 8,758 white families living in 130 localities in 18 States and including 39,185 individuals. Each family was visited at intervals of 2 to 4 months for a period long enough to obtain a sickness record for 1 year. On the first call a record was made of the number of members of the household, together with data about sex, age, marital status, and communicable disease history of each person. On succeeding visits the canvasser recorded all illness that had occurred since the preceding call, with such pertinent facts about each case as the date of onset, the duration of disability and of confinement to bed, the nature of such medical service as was obtained, and the termination of the case. Thus there are available certain facts about the observed population and the illnesses suffered in the course of 12 months.[2]

Mortality.—The surveyed population of nearly 40,000 persons is sufficient in number to give a fair degree of reliability to the sickness rates, but the number of deaths in a group of this size is so few that they afford little indication of the expected mortality from different causes at specific ages. These nearly 9,000 families were living in rural, urban, and metropolitan areas of 18 States; in many other respects they were found to be similar to the general white population of the United States (4).

In the comparison of illness and death, mortality data from the registration States were used because of insufficient numbers of deaths within the surveyed group. That this substitution is justifiable is indicated in later pages, where a comparison is made of the death rates in the two groups (figs. 1 and 3). The illness data, as previously stated, apply to a 12-month period for each household, but the total time of observation extended over about 3 years, the record for the first family beginning in February 1928 and for the last one ending in June 1931; most of the observations, however, were made in 1929 and 1930. For this reason mortality data for the registration States for the years 1929 and 1930 are used.

DEFINITION OF AN ILLNESS AND THE CLASSIFICATION OF ITS CAUSES

Illness as here used refers to both injury and disease. What was actually included as cases, however, was necessarily influenced not only by the informant's (usually the housewife's) conception of illness but also by her memory. With visits as infrequent as 2 to 4 months, it is inevitable that many of the nondisabling illnesses would be terminated and forgotten before the next visit of the enumerator. However, if the record includes most of the real illnesses and excludes only the minor disorders, it may be as useful as a more complete one.

[2] Further details on the method of collecting the data and the characteristics and geographic distribution of the surveyed population are included in the first report in the series (4).

Illnesses that originated prior to the study and caused sickness during the year are included with those having their onset within the period of observation; 93 percent had their onset within and 7 percent prior to the year. The inclusion of these illnesses of prior onset is necessary to give proper representation to chronic ailments. A large proportion of the cases of such diseases as tuberculosis, cancer, diabetes, and cardio-renal affections originated prior to the study. A preceding paper shows for each diagnosis the number of cases with prior onset (4).

Considering an illness in the sense of a continuous period of sickness, one finds only 4.3 percent designated as due to more than one cause. In general, the more important or more serious cause was used as primary, except where a disease like pneumonia is commonly recognized as following measles or influenza, in which cases the antecedent condition was taken as primary.[3] In the present series of papers, illness rates for all causes and for the broad disease groups are always based on sole or primary causes only, so that a continuous period of sickness is never counted as two illnesses. Later papers will consider the incidence of specific diseases, such as pneumonia, appendicitis, and whooping cough; and in these studies all cases with the given diagnosis will be counted whether it was the sole, primary, or contributory cause of the illness. Whenever case rates are related to or compared with death rates, only the sole or primary causes can be used, because contributory causes are not available in the mortality data for the registration States.

EXTENT OF ILLNESS FROM ALL CAUSES IN DIFFERENT SEVERITY CLASSES

In the present study the crude annual rate was 850 illnesses per 1,000 persons observed. Adjustment to the age distribution of the white population of the registration States reduces this rate to 823 per 1,000. A rate so adjusted represents the rate that would obtain if the age-specific rates in the surveyed families had prevailed in a population with the age distribution of that in the registration States. Adjustment for age is necessary before sickness rates can be compared in the surveyed population with death rates in the general population. Rates in the preceding paper (4) which dealt with sickness only were not adjusted for age and hence they are somewhat different from the adjusted rates which are used exclusively in this discussion.

The Hagerstown (12) crude annual illness rate was 1,081 per 1,000 which becomes 1,053 when adjusted for age. Although this rate is somewhat above that of 823 per 1,000 for the present study,[4] both

[3] Further details on the method of classifying the causes of illness are included in the first report in the series (4).

[4] The excess in the Hagerstown rate over that of the present study is all in the respiratory diseases (adjusted rate for Hagerstown 649, for 18 States 329 per 1,000), the nonrespiratory rate being greater in this study (adjusted rate for Hagerstown 404, for 18 States 494 per 1,000). A comparison of results in the two studies is made in the first paper in the series (4).

indicate a frequency of illness of roughly one case per person per year. The incompleteness of this figure, so far as colds and other trivial attacks are concerned, is suggested by the results of intensive surveys in which the observed individuals made weekly or semimonthly reports which indicated annual rates as high as 3 per person for respiratory affections alone (8, 13). No pretense is made of such a degree of completeness in the present record, but it probably includes most of the real illnesses and some of the trivial affections that are so frequent.

In addition to the rate of 823 illnesses, nearly four-fifths of which were attended by a doctor, there were 438 services per 1,000 without illness in the usual sense of the word, including vaccinations and immunizations of all kinds, physical examinations, eye refractions, and dental services.

Of the total rate of 823 illnesses, 331 were nondisabling and the remainder, 492 per 1,000, were disabling; that is, they caused the patient to lose 1 or more days from his or her usual work, school, play, or other activities during the year of the study. Of the disabling cases, 84 percent were also confined to bed for 1 or more days—a rate for bed cases of 414 per 1,000 persons, leaving almost the same number, 409 per 1,000, with no days in bed. About one-fifth of the cases not in bed reported disability for 1 or more days (78 per 1,000 persons observed).

Of all cases reported, 79 percent were attended by a doctor and 7 percent were in a hospital for 1 or more days during the year of the study, a rate of 62 hospital cases per 1,000 persons observed. Almost as many cases (60 per 1,000 persons observed) had surgery in connection with the primary diagnosis. As some cases had surgery in connection with a contributory diagnosis and others had 2 or more surgical operations on the same illness, there was a total of 65 surgical operations per 1,000 persons observed. The rates quoted above have all been adjusted to the age distribution of the white population of the registration States.

Among white persons in the registration States (1929–30) there was an annual death rate of 11.1 per 1,000 population; in the surveyed families the death rate (adjusted for age) amounted to 9.6 per 1,000 persons observed.[5] Infant mortality which is expressed as deaths under 1 year of age per 1,000 live births, was 61 for white infants in the birth registration States, 1929–30; in the surveyed families the figure was 53 per 1,000 live births.[5] The canvassed groups included only families and would not include any representation from such institutions as almshouses, homes for the aged, insane hospitals, and orphanages, where the death rate is usually high. Somewhat lower death rates in the surveyed group than in the general population might therefore be expected.

[5] All mortality data for the surveyed group are based on the families observed for a full 12 months and those observed for less than that time. All sickness data are based on the full-time families only For further details, see footnote 6 to table 1.

CAUSES OF ILLNESS OF DIFFERENT SEVERITIES CLASSIFIED IN BROAD DIAGNOSIS GROUPS

Figure 1 shows the important causes of sickness of different types and severities discussed in the preceding section and the important causes of death. The cases are classified in the broad groups of the International List of the Causes of Death, the diseases being arrayed in each severity category according to the magnitude of the rates for the groups. The percentages are all based on adjusted rates, each being the percentage that the rate for a given diagnosis group is of the rate for all causes of the same severity category. The percentages

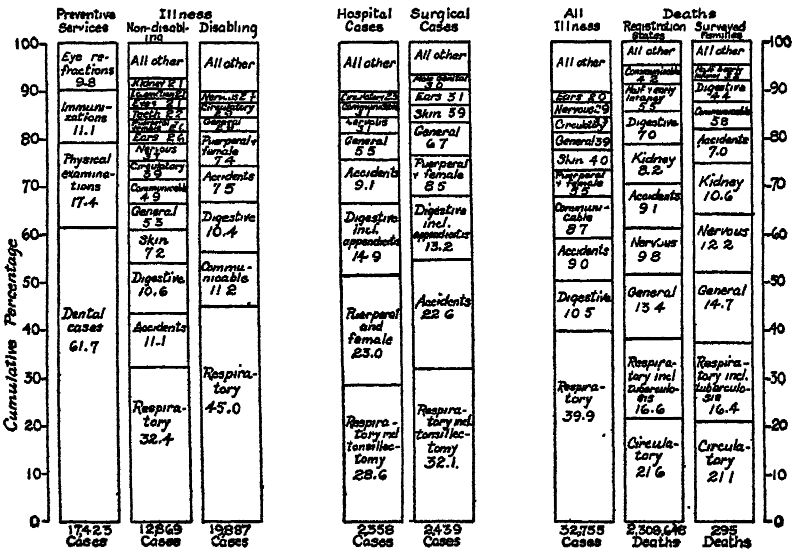


FIGURE 1.—Important causes of illness of different severity categories—percentage of cases due to each disease group—illness in canvassed white families in 18 States during 12 consecutive months, 1928–31; and deaths among white persons in the registration States, 1929–30. (Chart shows all diagnosis groups that caused 2 or more percent of the total cases in the given severity category. Percentages are based on rates adjusted to the age distribution of white persons in the registration States.)

that appear on the graph are the equivalent of the percentage of cases as they would occur in a population with the age distribution of that in the registration States in 1929–30.

The three bars on the right contrast the causes of sickness and death, the mortality being shown for both the registration States and the surveyed population. It will be noted that the mortality data for the canvassed families are quite similar to those for the registration States, the more important causes being the same and including approximately the same percentage of total deaths from all causes. In the comparison of sickness and mortality, reference will be made to the larger mortality experience of the registration States.

Respiratory and digestive diseases, accidents, and communicable diseases constitute nearly 70 percent of the causes of illness, respiratory alone accounting for two-fifths of all the cases. Of these four most frequent causes of illness, only respiratory appears in the four most important causes of death. Heart and circulatory diseases are the most frequent causes of death, but they are in the eighth place as causes of sickness. Likewise, general diseases (including cancer and diabetes) and affections of the nervous system (including cerebral hemorrhage) are among the four most important causes of death, but are relatively infrequent as causes of sickness. Accidents are third among the causes of sickness and fifth among the causes of death.

The three bars on the left present the causes of (*a*) medical care without sickness (largely preventive service), (*b*) sickness that did not keep the patient from his usual activities (nondisabling), and (*c*) sickness that caused the patient to lose 1 or more days from his usual work, school, or other activity (disabling). Care of the teeth and eye examinations for glasses are definitely therapeutic, but they have been included with preventive care because illness in the usual sense of the word is not commonly present at the time the service is rendered. More than three-fifths of the cases of care without illness are dental; 17 percent are physical examinations; 11 percent, vaccinations and immunizations of the various kinds; and 10 percent, eye refractions. In both disabling and nondisabling illness, respiratory diseases are the outstanding cause, constituting 32 percent of the nondisabling and 45 percent of the disabling cases.[6] Accidents stand fourth in the disabling class and second in the nondisabling, evidently including a considerable number of minor injuries that did not involve loss of time from usual activities. The communicable diseases occupy second place in the disabling class, but there are also a considerable number that are nondisabling, being sixth in that class. Digestive disorders are third in importance in both classes of illness; skin affections are fourth in the nondisabling but do not appear in the disabling class, since they amount to less than 2 percent of these cases.

The two center bars show the most frequent causes of illness that were hospitalized and that had surgical treatment. An examination of the diagnoses of hospitalized cases indicates that the hospital is used as a convenience in surgical and maternity cases as much as a concentration point for the most severe illnesses of all kinds. The four most frequent groups of hospital cases are respiratory (largely tonsil and adenoid operations), puerperal and female genital, digestive (nearly half of this group was appendicitis), and accidents. These four classes constitute more than three-fourths of the hospital cases.

[6] Respiratory illnesses constitute nearly half of the cases that were in bed for 1 or more days (4).

About 60 percent of all hospital cases were surgical, and about the same percentage of all surgical cases were hospitalized. Surgical cases show about the same line-up as hospital cases, respiratory (largely tonsil and adenoid operations), accidents, digestive (largely appendicitis) and puerperal and female genital diseases being the four most frequent diagnoses in surgical as well as in hospital cases. These four causes constitute 75 percent of the surgical cases.

AGE VARIATION IN ILLNESS OF DIFFERENT SEVERITIES

Figure 2 shows the age curve of illness from all causes classified as disabling and nondisabling (table 1). Disabling refers to illness that caused loss of 1 or more days from the person's usual activities, whether or not the individual was gainfully employed. Curves are also shown for cases that were not in bed and for those confining the patient to bed for 1 or more days; all cases in the latter category are included in the disabling class, constituting 84 percent of the illnesses in that group.

TABLE 1.—*Age incidence of illness of varying severity and of mortality—illness in canvassed white families in 18 States during 12 consecutive months, 1928–31, and mortality among white persons in the registration States,*[1] *1929–30. (All causes; sole or primary diagnosis only)*

Age	Surveyed group						Registration States	Relation between illness and death rates		White population (years of life) for the registration States, 1929–30 (in thousands)
	Annual illness rates per 1,000 population				Population (years of life) for illness data	Annual death rates per 1,000 population[6]	Annual death rates per 1,000 population	Estimated case fatality, percent[3]	Estimated number of illnesses per death[4]	
	All illness	Nondisabling cases	Disabling cases	Cases in bed						
All ages:										
Crude	850	334	516	434	[5] 38,544	6.90	11.07	------	------	[5] 208,492
Adjusted[2]	823	331	492	414	------	9.58	11.07	1.35	74	------
Under 5	1,212	548	664	609	5,513	11.11	17.11	1.41	71	18,935
5–9	978	253	725	563	5,715	1.73	1.92	.20	511	20,904
10–14	679	190	489	372	4,568	.98	1.46	.21	404	20,140
15–19	599	227	372	288	3,050	2.97	2.41	.40	248	19,276
20–24	672	242	430	373	2,119		3.37	.50	199	18,040
25–29	798	317	481	427	2,491	2.71	3.77	.47	212	16,304
30–34	838	343	495	435	3,149		4.30	.51	195	15,527
35–39	792	346	446	392	3,292	4.57	5.28	.67	150	15,708
40–44	753	349	404	339	2,638		6.08	.93	108	13,841
45–49	737	347	390	327	1,928	6.83	9.35	1.27	79	12,166
50–54	790	392	398	342	1,423		13.02	1.65	61	10,420
55–59	840	402	438	348	838	21.07	19.09	2.27	44	8,283
60–64	850	439	411	334	635		28.00	3.29	30	6,723
65 and over	979	430	549	497	998	77.13	75.10	7.67	13	12,008
Number of cases—all ages[5]	32,756	12,869	19,887	16,726	------	295	2,308,648	------	------	------

[1] Registration States included all except Texas and South Dakota in 1929 and all except Texas in 1930.
[2] Rates for all ages are adjusted to the age distribution of the white population of the death registration States, 1929–30.
[3] Percentage that death rate in registration States is of case rate in surveyed population.
[4] Ratio of case rate in the surveyed population to death rate in the registration States.
[5] "All ages" includes a few of unknown age.
[6] The death rate in the surveyed group is based on both the families observed for a full 12-month period and those observed for less than that time, all part-time persons in both groups being counted in the population for only the actual time under observation. As a death in the family was sometimes the reason for the discontinuance of reports, it was necessary to use both groups of families in computing the death rate. The years of life in the full- and part-time families was 42,749. All sickness data are based on the full-time families only.

There is somewhat more variation with age in the nondisabling than in either the disabling or bed cases; the rise with age after 20 years is slightly greater and the rate for children under 5 years is also relatively higher in the less severe nondisabling class. An examination

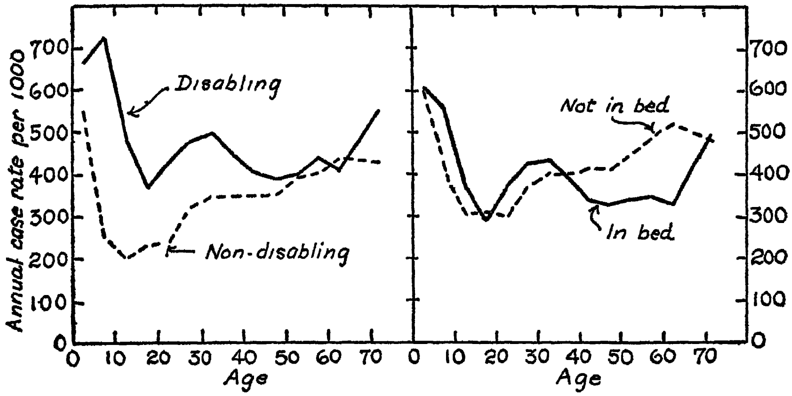


FIGURE 2.—Age incidence of illnesses of different severity categories—canvassed white families in 18 States during 12 consecutive months, 1928–31.

of the age curves of nondisabling illness in broad diagnosis groups indicates that respiratory and digestive affections are the principal causes that contribute to the more rapid rise as age increases; it is also

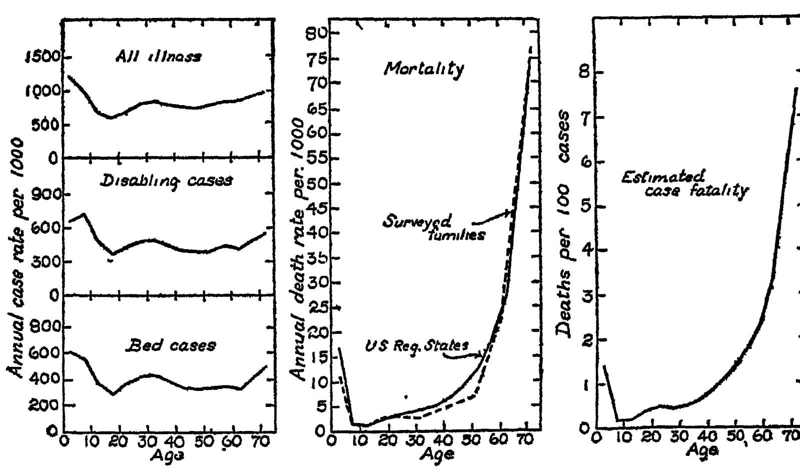


FIGURE 3.—Variation with age in illness, mortality, and estimated case fatality rates—illness in canvassed white families in 18 States during 12 consecutive months, 1928–31; and mortality among white persons in the registration States, 1929–30. (Scales are so made that the adjusted rate for all ages represents an interval on the vertical rate scale that corresponds to 20 years on the horizontal age scale.)

these groups that are largely responsible for the relatively high nondisabling illness rate among children under 5 years.

Figure 3 shows, among other things, age-specific sickness rates in the surveyed population and age-specific mortality rates in the regis-

tration States. The scales in both the sickness and mortality charts are so made that the adjusted rate for all ages plots on the vertical axis at a distance above the base line that is equal to the distance representing 20 years on the horizontal axis. Such an arrangement makes the relative variation with age in the sickness and death curves comparable in the same way as in curves of the ratio of the rate in each age to the rate for all ages. The variation with age is far greater in mortality than in sickness. The mortality curve increases steadily from a minimum at 10–14 years to a maximum at the oldest ages. The sickness curve has its minimum at 15–19, with a small peak at 30–34 years followed by a decline to 45–49 and then a gradual increase to the end of life; but the relative difference between sickness rates for persons over 65 and 15–19 years of age is very small as compared with the relative difference between mortality rates for the same ages. If the mortality curve were extended forward to the ages 75 and beyond, it would continue to rise rapidly, and if extended back to the age group under 1 year its rise would be so rapid that it would reach a height about equal to that of the oldest ages. On the other hand, if the sickness curve were similarly extended in both directions there would be practically no change in the morbidity picture. The age curves of the more serious illnesses that disabled and that confined the patient to bed do not resemble the mortality curve any more closely than does the curve of all illness.

An approximate idea of the case fatality of illness at the different ages may be obtained by relating mortality rates in the registration States to sickness rates in the surveyed population. Considering all ages, a death rate of 11.1 when related to a total case rate of 823 per 1,000 indicates a fatality of 1.35 per 100 cases. Relating the same death rate to the disabling case rate of 492 and the bed case rate of 414 per 1,000 gives a fatality of 2.25 per 100 disabling cases and of 2.67 per 100 cases that caused confinement to bed. In other words, there was a total of 74 cases of illness for each death; there were 44 disabling cases for each death; and there were 37 cases which confined the patient to bed for each death during the year.

Figure 3 shows by age the ratio of the mortality rate to the sickness rate—an estimated case fatality, or deaths per 100 cases of illness. Because sickness varies from age to age so much less than mortality, the age curve of the estimated case fatality is quite similar to that of mortality. If the sickness rates were the same for all ages, the denominators entering the calculation of the successive case fatalities would be the same, and hence the fatality curve would be identical in shape with the mortality curve.

The reciprocal relation of mortality and sickness in terms of the estimated number of illnesses per death at the different ages is shown in table 1. From 511 illnesses for each death at 5–9 years, the number

declines to only 13 cases per death above 65 years Likewise, in the youngest group there are fewer cases per death, reflecting the higher fatality of illness at the extremes of life. This is also evident in the series of percentages representing the case fatality by age.

DISTRIBUTION OF INDIVIDUALS ACCORDING TO THE FREQUENCY OF ILLNESS

An annual illness rate of one case per person does not indicate that every person was sick during the year Such an assumption would be quite erroneous; among the nearly 40,000 individuals, each of whom was observed for 12 months, almost half (48 percent) were not sick, about a third (32 percent) were sick once, about one-eighth (13 percent) were sick twice, and the other 6 to 7 percent were sick three or more times during the year of the study. Table 2 shows by

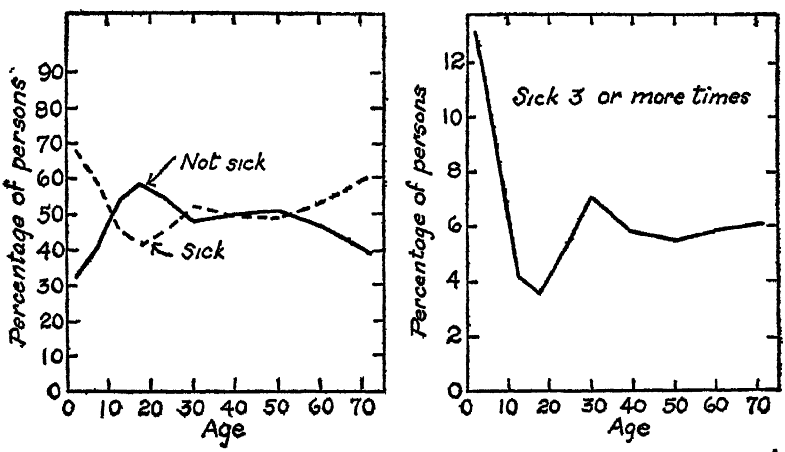


FIGURE 4.—Percentage of persons sick and not sick during a 12-month period—canvassed white families in 18 States during 12 consecutive months, 1928–31 (Scales are so made that the adjusted percentage for all ages represents an interval on the vertical percentage scale that corresponds to 40 years on the horizontal age scale)

age the distribution of persons according to the number of times sick, and figure 4 shows some of the data graphically. The proportions who were not sick, which might be called the age curve of good health, reached a maximum at 15–19 years, with minima at the two extremes of life. The curve for persons sick three or more times shows the ages when individuals are likely to be ill more frequently than the average; infancy and early childhood, and 25 to 35 years of age are the two periods when individuals are most likely to suffer repeated illnesses during the year. The adult peak is probably due to childbearing and its attendant illnesses.

TABLE 2.—*Age variation in the proportions of persons sick and not sick during the year under observation—canvassed white families in 18 States during 12 consecutive months, 1928–31*

Times sick during 12 months	All ages: Number of persons	All ages: Crude	All ages: Adjusted[1]	Age: Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
		Percentage of persons who were sick the specified number of times											
Not sick	18,201	47.4	48.2	32.4	41.5	54.1	58.9	55.3	48.3	50.2	51.1	46.8	39.0
Sick once	12,352	32.1	32.1	34.7	33.6	31.1	28.7	30.2	32.1	31.4	30.8	33.1	39.1
Sick twice	5,210	13.6	13.2	19.8	16.3	10.7	8.8	9.7	12.6	12.7	12.6	14.2	15.8
Sick three or more times	2,658	6.9	6.5	13.1	8.6	4.1	3.6	4.8	7.0	5.7	5.5	5.9	6.1
Number of persons under observation[2]		38,421		5,102	5,739	4,584	3,101	2,179	5,683	5,948	3,365	1,494	1,049

[1] Percentages for all ages are adjusted to the age distribution of the white population of the death registration States, 1928–30.
[2] All except 1.5 percent were under observation during the whole 12 months; births during the study are excluded.

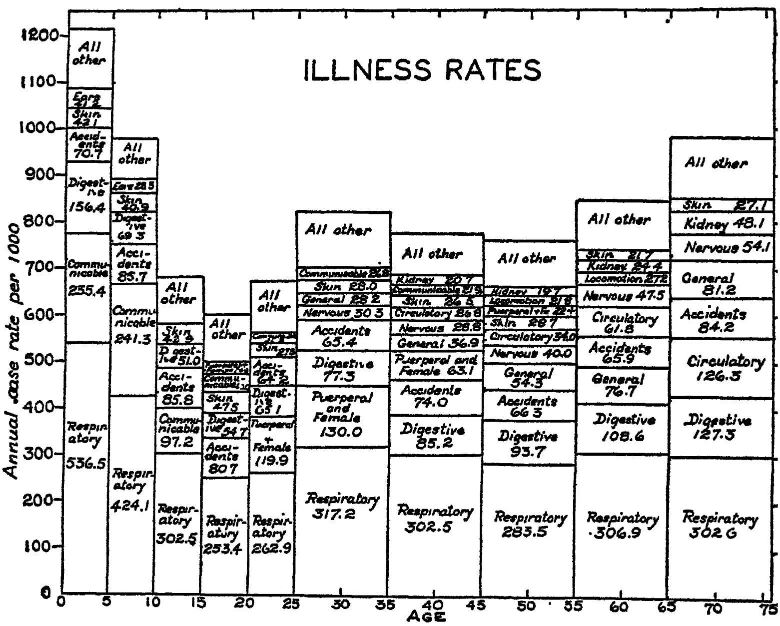
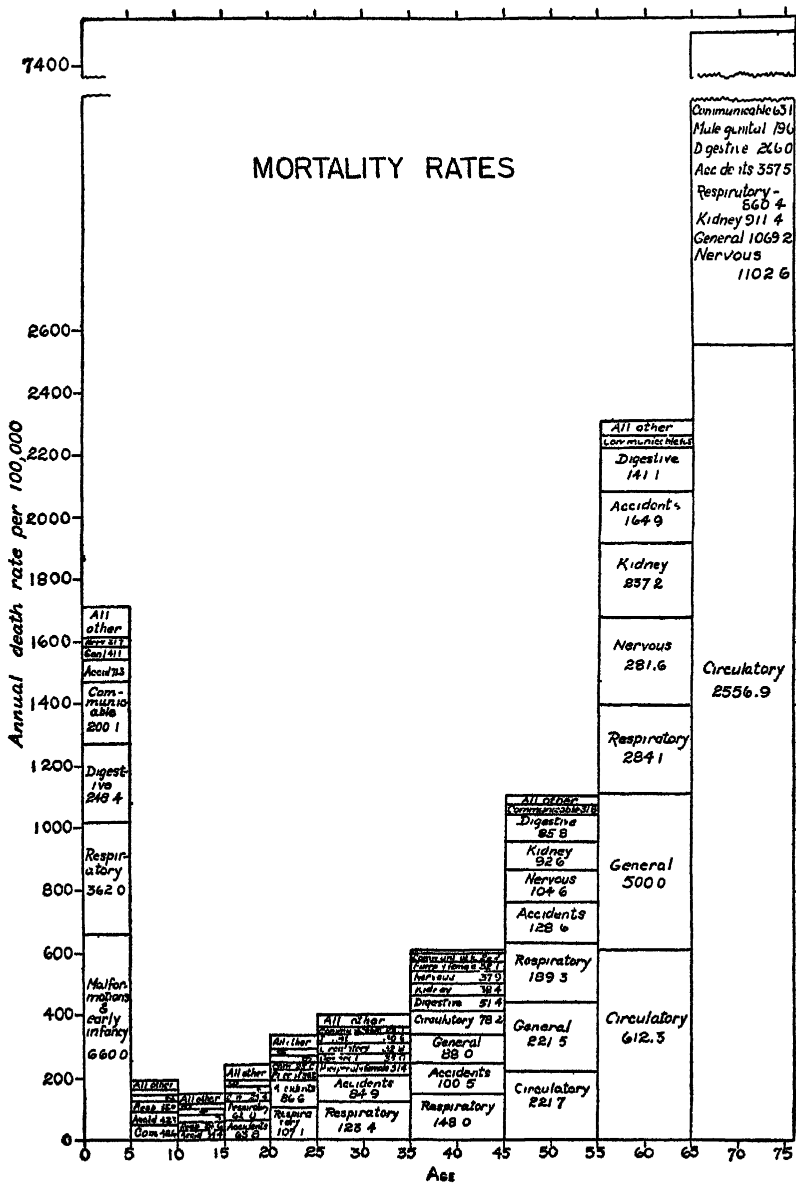


FIGURE 5.—Illness rates and the broad diagnostic composition of the case load at different ages—canvassed white families in 18 States during 12 consecutive months, 1928–31. (Chart shows all diagnosis groups with rates of 20 or more per 1,000.)

THE PRINCIPAL DISEASE GROUPS THAT ENTER INTO THE TOTAL ILLNESS AND MORTALITY RATES AT DIFFERENT AGES

The total sickness and the total death rates and also the major causes of illness and mortality vary considerably with age. Figures 5 and 6 are intended to portray the general aspects of both of these phases of morbidity and mortality, respectively.



Note.—The numbers in the blank spaces represent the following causes and rates:

Ages 5–10: 1—General, 11.3.
2—Digestive, 21.3.

Ages 10–15: 3—Circulatory, 15.7.
4—Digestive, 17.5.
5—Communicable, 23.3.

Ages 15–20: 6—Circulatory, 19.5.
7—Digestive, 20.7.

Ages 20–25: 8—Circulatory, 22.0.
9—Digestive, 23.1.

Figure 6.—Death rates and the broad diagnostic composition of the mortality load at different ages—white population of the registration States, 1920–30. (Chart shows all diagnosis groups with rates of 20 or more per 100,000 and other rates to give a minimum of 5 principal causes for each age.)

In figure 5 the total height of the bar or rectangle for a given age group represents the total sickness rate per 1,000 persons of that age, and these rectangles are subdivided into smaller rectangles that represent sickness rates for the various disease classes. They thus indicate the diagnostic composition of the sickness load at the various ages. The order of the diseases varies in the different age groups; the arrangement is according to the size of the rate, all diagnoses being shown that have a frequency of 20 or more per 1,000 persons observed. For example, circulatory diseases appear as third in importance in the age group over 65 years, as seventh among persons 35–44, and do not appear under 5 years because the rate is less than 20 per 1,000.

Considering all illness regardless of cause, the highest rates are found among children. Persons under 5 years suffer more frequent attacks of illness than those at any other age, and those 5 to 9 are sick about as frequently as persons over 65 years. The lowest rate occurs at 15–19 years. While there is some increase in sickness among older persons, the rise with age is not as great as might be expected. It should be remembered, however, that the data in this and other charts in this report refer to frequency of cases and not to the duration of sickness or disability or time in bed.

Respiratory diseases are an overwhelming part of the sickness burden at every age; accidents and digestive disorders are also frequent at all ages. The communicable diseases are important, but they become less frequent after 20 years of age and are replaced in adult ages by female diseases and puerperal conditions and in the older ages by the cardio-renal, the nervous, and other presumably noninfectious general diseases commonly referred to as the degenerative group.

Figure 6 for mortality is set up like figure 5 for sickness. The total height of the bars or rectangles represents the total death rate per 100,000 for that age, and the subdivisions indicate the diagnostic composition of the mortality load at the various ages. All disease groups are shown that have a rate of 20 or more per 100,000 and enough with smaller rates to give a minimum of five principal causes of death for each age group.

The chief interest in mortality at the moment is for comparison with sickness. Considering the principal affections among persons of specific ages, one finds that for children under 5 years the main causes of death are malformations and diseases of early infancy, which are relatively unimportant as causes of illness. Aside from these causes, the important diagnoses in both mortality and sickness are respiratory, communicable, digestive, and accidents.

From 10 to 20 years of age, accidents are the most frequent causes of death; persons in this period seem to possess much resistance and deaths from diseases are not frequent. Respiratory affections are

frequent as causes of illness, and accidents occupy third place at 10–14, and second place at 15–19 years.

From 20 to 45 years, respiratory diseases are the most important causes of both illness and death; tuberculosis is high at these ages and puts the respiratory group at the top of the death list; the minor respiratory affections are the important element in the high respiratory sickness rate.

After 45 years the circulatory diseases take first place as causes of death; among persons 65 years old and over the death rate from circulatory diseases alone exceeds the total rate from all causes at 55–64 years.

Further comparisons need not be made; figures 5 and 6 afford data on the most frequent causes of sickness and death for all of the several age groups in the life span. Age curves for specific affections and disease groups will be presented in later papers. Figures 5 and 6 are intended to give only a general view of the kinds of illness and the causes of death that are important at the different ages.

RELATIVE IMPORTANCE OF VARIOUS DISEASE GROUPS AS CAUSES OF ILLNESS AND DEATH AT DIFFERENT AGES

Sickness and particularly mortality rates vary so much at the different ages that it is hard to get from figures 5 and 6 a clear idea of the proportion of cases and deaths that are due to specified causes. Figures 7 for illness and 8 for mortality are arranged to show the relative importance of given diagnosis groups in terms of the percentage of cases and deaths, respectively, that are credited to the various disease classes.

Unlike the former charts, the order of arrangement of the diseases does not change in the different ages and a given disease can be followed through the several ages. The percentages are plotted cumulatively, so the slopes of the lines bounding an area that represents a given diagnosis have no meaning in fact, the diseases have been put in an order that makes these lines as near horizontal as is consistent with keeping like causes together. The sole item to be noted in interpreting the graphs is the width of the band representing the disease at the different ages indicated on the horizontal scale.

In the illness chart, affections of the teeth and gums, of the eyes, and of the bones and organs of locomotion have all been put in the miscellaneous group with other and ill-defined disorders, since they include only a small proportion of the cases at any age. For the same reasons these and the diseases of the skin, of the ears, and of the male genital organs are put in the miscellaneous class in the death chart. The order of the disease groups is approximately the same in the two figures.

At the bottom of the charts are the classes composed largely of the degenerative diseases—the nervous disorders (including cerebral hemorrhage), the kidney and bladder diseases, the heart and circulatory ailments, and the general diseases (including cancer and diabetes). Under 5 years, the total of these diseases amounts to only 4 percent of the cases of illness and 8 percent of the deaths; at the oldest ages they cause a third of the illnesses and three-fourths of the deaths. The communicable diseases are mostly confined to the ages under 20 years as causes both of illness and death. Female diseases occur largely in the ages of and immediately following childbearing.[7]

Respiratory affections are represented by a wide band equaling more than two-fifths of the illnesses among school and preschool

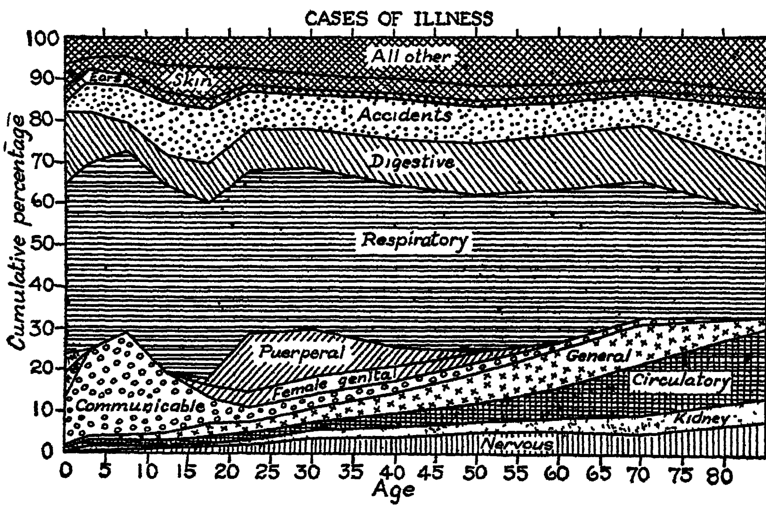


FIGURE 7.—Percentage of illnesses at specific ages that are due to each broad disease group—canvassed white families in 18 States during 12 consecutive months, 1928–31. ("M. Gen." refers to male genital conditions, chiefly circumcision, and "M. E. I." refers to malformations and diseases of early infancy.)

children, but narrowing to about a third of the cases among old people. As a cause of mortality the respiratory diseases (largely pneumonia and tuberculosis) are particularly important in the young adult ages, where they account for a third of all the deaths—more than any other disease group in these ages; in the oldest ages they are surpassed by several of the degenerative disease groups as causes of death. Digestive diseases and accidents are also important at every age as causes of death as well as causes of sickness. These groups are responsible for about the same proportion of illnesses at the different ages, but

[7] The female and the puerperal groups would appear as approximately double in importance among the illnesses of females, but in this chart and throughout this paper all illness is related to the total population or to the total cases in both sexes. This procedure was chosen because the problem under consideration is the importance of a given disease as a part of the sickness load at a specific age, regardless of what elements of the population bear the burden. A later paper will consider illness among males and females separately.

accidents and to a lesser extent digestive diseases cause a higher proportion of deaths among children and young adults than in the older ages.

SUMMARY

Records of illness were obtained on 8,758 white families in 130 localities in 18 States for a period of 12 consecutive months between February 1928 and June 1931. Each family was visited at intervals of 2 to 4 months to obtain the data.

The surveyed families include representation from nearly all geographic sections, from rural, urban, and metropolitan areas, from all income classes, and of both native- and foreign-born persons. The

DEATHS

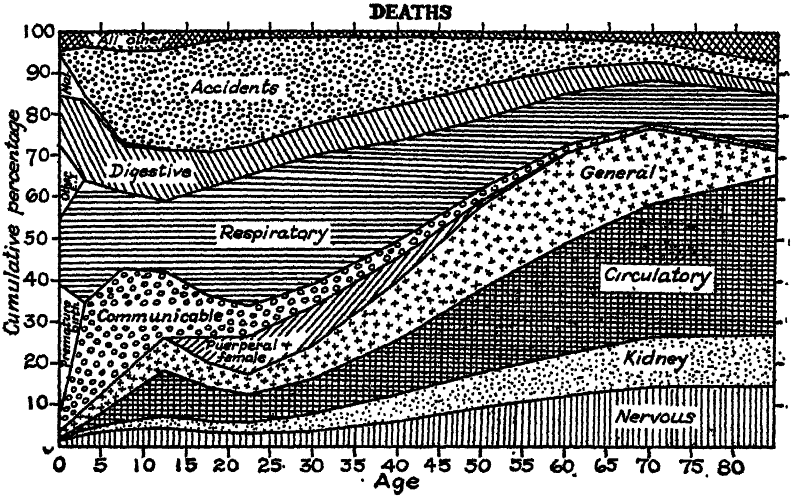


FIGURE 8.—Percentage of deaths at specific ages that are due to each broad disease group—white persons in the registration States, 1929–30. ("Mal." refers to malformations, and "Other E. I." refers to diseases of early infancy except premature birth.)

proportions of these various elements included are not identical with those in the population of the United States, but the variations are not generally large. In other respects also the surveyed group is not dissimilar to families in the general white population of the United States.

Mortality in the white population of the registration States for the years 1929–30 is used to supplement the sickness data. A comparison with the deaths in the canvassed families indicated that the use of the larger mortality experience was justifiable.

The major causes of death are not the most frequent causes of illness. The respiratory diseases are outstanding as causes of illness whether nondisabling or disabling; the degenerative diseases are more important as causes of death (fig. 1).

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When illness is divided into nondisabling and disabling, and into cases in bed and not in bed, the variation with age is about as great in one class as another. The more severe cases that were in bed show a considerable peak from 20 to 40 years of age that reflects the illnesses associated with childbearing (fig. 2).

Illness is most frequent under 5 years and least frequent at 15–19 years of age. The frequency is about the same among persons 5–9 and 65 years and over. Deaths are least frequent at 10–14 and most frequent in the oldest ages (fig. 3).

Death rates vary with age far more than illness rates of any severity (fig. 3). Cases of illness per death range from 511 at 5–9 years to 13 at 65 years and over.

The proportion of the individuals who were sick 3 or more times during the 12-month period of observation varies from 13.1 percent for children under 5 years to 3.6 percent at 15–19 years (fig. 4).

At specific ages the major causes of death are not generally the most frequent causes of illness (figs. 5 and 6). The proportions of the cases of illness that are due to certain causes varies a great deal with age; similar proportions for deaths vary still more with age (figs. 7 and 8).

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EPIDEMIOLOGICAL STUDY OF PLAGUE IN THE HAWAIIAN ISLANDS

A study of the epidemiology of plague in the Hawaiian Islands, the report of which has recently been published by the Public Health Service,[1] was instituted primarily to determine the reasons why two entirely different types of plague infection have occurred in the Hawaiian Islands since the introduction of the disease in 1899. In order to secure the necessary data, a survey of rodents and their fleas was conducted in four regions, or sectors. Two of these were the urban communities of Honolulu, on the Island of Oahu, and of Hilo, on the Island of Hawaii, where the duration of their plague epidemics was limited to 12 years, and the other 2 were the rural regions of Hamakua district, on the Island of Hawaii, and the central part of the Island of Maui, where plague is apparently as well entrenched today as it was at the time these districts were orginally infected many years ago—2 rural localities where the infection may be considered as being endemic at the present time.

During the year covered by this survey (April 1932–March 1933), 59,062 fleas were found on 19,755 rats trapped alive. Seven species of fleas were obtained from five species of rats and from mice and mongooses. Some of the observations made from tabulations of the material collected are briefly outlined in the following:

(1) The percentage of rats infested with different species of fleas was found to have as much significance as the usual form of index representing the average number of fleas per rat, and to be somewhat more reliable in judging the degree of flea infestation.

(2) *Xenopsylla cheopis* was found to be more widely distributed than any other species of fleas. This species was present in all localities where plague has occurred, and in the urban communities of Honolulu and Hilo it was the only rodent flea found in sufficient numbers to account for the transmission of rodent plague. The most noteworthy

[1] Epidemiological study of plague in the Hawaiian Islands, by C. R. Eskey. Public Health Bulletin No. 213. Government Printing Office, Washington, 1934.

information secured regarding rodent infestation with *X. cheopis* was that showing the prevalence of these fleas on rats to be directly dependent upon the relation to buildings of the place in which the animals were trapped. In all localities *X. cheopis* was found in greatest numbers on rats trapped within the shelter of buildings; while in all regions where plague has occurred, so few of these fleas were found on rats caught over 100 feet from buildings that they could not have caused plague epizootics among field rats such as are known to have occurred both in Hamakua district and in central Maui. Evidence showed that high temperatures and excessive dampness adversely affected the existence of *X. cheopis* on rats trapped outside buildings, but had little effect upon the degree of infestation of rats trapped inside buildings. It was concluded that the chief breeding places of *X. cheopis* were located within the shelter of buildings, and that rodent infestation with this species was chiefly derived from their contact with buildings.

(3) *Xenopsylla hawaiiensis* (Jordan 1932) was discovered during this survey. The natural host of this species is the field rat, *Rattus hawaiiensis*. It was also found in considerable numbers on *R. norvegicus*, but members of the *Rattus rattus* family were only slightly infested. *X. hawaiiensis* was rarely found on rats trapped inside buildings, and was present in greater numbers on animals caught in the fields than on those trapped close to buildings. In the Honolulu and Hilo sectors, where plague infection ran a limited course, very few *X. hawaiiensis* were found, even on field rats; but in Hamakua district, on the Island of Hawaii, and in Central Maui these fleas were collected from field rats in sufficient numbers to account for the continuous transmission of plague among animals in the fields. In localities where the monthly precipitation was high and in those that were very dry because of lack of rain, there was a low degree of *X. hawaiiensis* infestation of field rodents. The comparatively slight infestation of rats caught within buildings, and the fact that *X. hawaiiensis* larvae could not be raised in the laboratory until green grass was provided for food, indicate that green vegetation is required for the multiplication of this species, and that, therefore, its breeding places are outside of buildings.

(6) *Nosopsyllus fasciatus* (*C. fasciatus*) and *Leptopsylla segnis* (*L. musculi*) were found in considerable numbers on rats caught at altitudes of over 2,500 feet and 1,000 feet, respectively. They were not present on rats caught in the seaports of Honolulu and Hilo. No evidence was collected to implicate these fleas in the transmission of plague in the Hawaiian Islands.

Echidnophaga gallinacea was frequently found on rats in enormous numbers, particularly in the relatively dry localities.

Ctenocephalides felis felis was present on rats caught in all four sectors.

Only seven *Pulex irritans* were found on rats.

(7) *Rattus hawaiiensis*, a species very similar to *R. concolor* of Asia, was found in all areas where trapping operations were conducted. In regions where endemic plague exists, this species comprised 25 percent or more of the rats trapped. They were least prevalent in the drier zones where vegetation for food was least abundant, which were also the regions where few *X. hawaiiensis* were found. A few of these rats were caught inside buildings, but no nests were found in buildings or in trees. *Rattus norvegicus* was not found in the localities in central Maui where plague has occurred, but was trapped in other parts of this island. It was less frequently encountered in the fields than any other rodents.

Rattus rattus, *Rattus rattus alexandrinus* type, and *Rattus rattus frugivorus* were present in all localities. These rats were caught in considerable numbers in the fields. They were found to nest in trees, under buildings, and even in underground burrows.

(8) Experiments conducted in the laboratory revealed very similar biological characteristics in *X. cheopis* and *X. hawaiiensis*. Their developmental stages were the same; both species died following starvation in about the same number of days, and young fleas of both species raised in the laboratory survived starvation longer than those collected from trapped rats. The reactions following their bites were identical, and included itching only in the same 2 individuals out of 20 tested. *X. hawaiiensis* were raised more successfully from eggs deposited in test tubes than were *X. cheopis*, but the former did not multiply as readily on white rats. A female *X. cheopis* fed on human blood lived at room temperature for 203 days, while a female *X. hawaiiensis* lived in this manner for 293 days.

(9) The eradication of plague from the two rural regions where the infection is now endemic in the Hawaiian Islands presents almost insurmountable difficulties. Here, rat proofing of buildings and trapping do not offer much hope of accomplishing any results. The intensive and constant use of poisons, such as thallium sulphate and arsenic, with an assortment of baits prepared with whole grains, appears to offer the most practicable means for reducing the exterior rodent population to a point where the infection may disappear. It is believed that from 3 to 5 years must elapse after the last evidence of rodent or human plague before the disease may be considered eradicated.

COURT DECISION ON PUBLIC HEALTH

Provisions of city ordinance regulating hours of opening and closing barber shops held void.—(Washington Supreme Court; *Patton* v. *City of Bellingham et al.*, 38 P. (2d) 364; decided December 6, 1934.) An ordinance of the city of Bellingham provided that it should be unlawful to open a barber shop earlier than 8 a. m. or to close the same later than 6 p. m. on weekdays other than Saturday or to close later than 7 p. m. on Saturday or days preceding a holiday. Provision also was made for the inspection of barber shops by a sanitary inspection board or any of its members for the purpose of ascertaining the sanitary condition of such shops.

The validity of the provisions of the ordinance relating to the hours of opening and closing was attacked and, concerning such provisions, the supreme court said that it was of the view that they were unreasonable and arbitrary and, consequently, void. The court also said that it had no hesitancy in saying that the provisions relative to the inspection of barber shops constituted a valid exercise of the city's police power and, as such, were reasonable and proper.

DEATHS DURING WEEK ENDED FEB. 2, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Feb. 2, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	9,104	8,793
Deaths per 1,000 population, annual basis	12.7	12.3
Deaths under 1 year of age	624	624
Deaths under 1 year of age per 1,000 estimated live births	57	58
Deaths per 1,000 population, annual basis, 5 weeks of year	13.2	12.5
Data from industrial insurance companies		
Policies in force	67,211,803	67,435,280
Number of death claims	14,497	14,546
Death claims per 1,000 policies in force, annual rate	11.2	11.2
Death claims per 1,000 policies, 5 weeks of year, annual rate	11.1	11.1

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Feb. 9, 1935, and Feb. 10, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 9, 1935, and Feb. 10, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 9, 1935	Week ended Feb. 10, 1934	Week ended Feb. 9, 1935	Week ended Feb. 10, 1934	Week ended Feb. 9, 1935	Week ended Feb. 10, 1934	Week ended Feb. 9, 1935	Week ended Feb. 10, 1934
New England States:								
Maine	2		1	6	238		0	0
New Hampshire					4	181	0	0
Vermont	1	1			4	75	0	0
Massachusetts	10	9			612	1,906	0	1
Rhode Island		2	5		26	6	0	0
Connecticut	6	8	9	18	617	33	1	0
Middle Atlantic States:								
New York	23	31	[1] 38	[1] 30	1,313	860	4	4
New Jersey	11	20	30	17	219	226	1	2
Pennsylvania	45	56			2,541	1,835	6	2
East North Central States:								
Ohio	60	33	40	14	516	407	7	3
Indiana	33	38	111	45	625	405	4	3
Illinois	59	29	72	48	2,101	436	13	8
Michigan	6	12	6	8	501	64	0	0
Wisconsin	1	6	187	121	1,279	865	0	1
West North Central States:								
Minnesota	12	5	41		2,135	177	1	0
Iowa	11	17	214	14	1,023	119	0	1
Missouri	25		396	26	457	980	0	1
North Dakota	5	7	33	38	152	203	0	0
South Dakota	2			4	74	450	0	0
Nebraska	7	6	20	11	520	86	5	0
Kansas	11	10	61	4	1,139	84	2	2
South Atlantic States:								
Delaware	4	1				136	0	0
Maryland [2]	8	13	180	45	59	173	4	0
District of Columbia	18	6	7	4	11	324	2	1
Virginia	24	37			930	785	2	2
West Virginia	23	18	371	55	529	32	11	0
North Carolina	23	23	198	67	778	2,375	4	1
South Carolina [3]	3	21	1,022	591	17	495	0	0
Georgia [3]	4	23	535	177		2,122	0	0
Florida	3	8	80	4	36	55	0	0
East South Central States:								
Kentucky	23	33	383	31	666	183	5	0
Tennessee	17	15	351	207	18	794	6	1
Alabama [3]	21	24	2,392	288	256	579	1	0
Mississippi [2]	8	14					1	0
West South Central States:								
Arkansas	2	8	31	123	13	520	5	0
Louisiana	46	26	63	19	71	89	0	0
Oklahoma [4]	12	12	279	156	59	300	2	0
Texas [3]	56	133	901	493	123	878	2	8

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 9, 1935, and Feb. 10, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 9, 1935	Week ended Feb. 10, 1934	Week ended Feb. 9, 1935	Week ended Feb. 10, 1934	Week ended Feb. 9, 1935	Week ended Feb. 10, 1934	Week ended Feb. 9, 1935	Week ended Feb. 10, 1934
Mountain States:								
Montana	2	4	303	34	223	27	1	0
Idaho			1	1	74	63	1	0
Wyoming		2			210	12	1	0
Colorado	3	17			586	64	0	3
New Mexico	5	7	80	10	20	114	1	1
Arizona	1	7	214	26	10	14	1	0
Utah [1]					10	939	0	0
Pacific States:								
Washington		1	33		107	765	3	1
Oregon		2	181	50	81	53	1	0
California	54	40	461	34	282	1,187	6	2
Total	690	785	9,530	2,819	21,268	22,494	104	48

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 9, 1935	Week ended Feb. 10, 1934	Week ended Feb. 9, 1935	Week ended Feb. 10, 1934	Week ended Feb. 9, 1935	Week ended Feb. 10, 1934	Week ended Feb. 9, 1935	Week ended Feb. 10, 1934
New England States:								
Maine	1	0	18	16	0	0	2	1
New Hampshire	0	0	10	24	0	0	0	0
Vermont	0	0	17	10	0	0	0	1
Massachusetts	0	0	169	245	0	0	1	2
Rhode Island	0	0	12	17	0	0	0	0
Connecticut	0	0	49	58	0	0	0	2
Middle Atlantic States:								
New York	3	2	699	692	0	0	5	7
New Jersey	0	0	138	203	0	0	1	3
Pennsylvania	1	0	647	695	0	0	9	10
East North Central States:								
Ohio	0	0	867	528	2	1	4	7
Indiana	0	1	269	235	1	2	1	2
Illinois	1	1	954	600	2	2	9	4
Michigan	0	2	319	597	0	0	6	6
Wisconsin	0	0	627	199	35	32	3	2
West North Central States:								
Minnesota	0	0	122	76	2	11	1	2
Iowa	0	2	101	84	2	6	2	1
Missouri	2	0	119	121	4	12	5	2
North Dakota	0	0		45	0	0	0	0
South Dakota	0	0	10	16	2	4	2	1
Nebraska	0	0	39	17	27	3	0	0
Kansas	0	0	108	112	3	9	0	1
South Atlantic States:								
Delaware	0	0	22	4	0	0	0	0
Maryland [2]	0	0	97	72	0	0	4	3
District of Columbia	0	0	25	19	0	0	2	0
Virginia	0	1	78	70	0	0	3	11
West Virginia	2	0	157	52	0	0	1	3
North Carolina	1	0	26	64	0	0	0	1
South Carolina [3]	0	1	10	9	0	4	4	18
Georgia [3]	0	0	3	10	0	0	2	4
Florida	0	0	16	5	0	0	0	1
East South Central States:								
Kentucky	0	1	61	68	0	3	4	7
Tennessee	1	0	26	45	1	2	3	4
Alabama [3]	1	0	15	34	0	0	0	2
Mississippi [3]	0	0	21	26	0	2	3	5
West South Central States:								
Arkansas	0	0	15	11	3	1	1	1
Louisiana	1	0	25	25	0	1	15	4
Oklahoma [4]	0	0	32	27	1	1	5	1
Texas [3]	1	0	79	142	93	20	16	22

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 9, 1935, and Feb. 10, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 9, 1935	Week ended Feb. 10, 1934	Week ended Feb. 9, 1935	Week ended Feb. 10, 1934	Week ended Feb. 9, 1935	Week ended Feb. 10, 1934	Week ended Feb. 9, 1935	Week ended Feb. 10, 1934
Mountain States:								
Montana	0	0	15	25	9	0	0	3
Idaho	0	0	10	4	0	4	0	3
Wyoming	0	1	19	6	12	0	0	0
Colorado	0	1	291	52	0	2	1	1
New Mexico	0	0	18	38	1	0	1	3
Arizona	0	0	35	44	0	0	2	2
Utah [2]	0	0	85	9	0	0	0	0
Pacific States:								
Washington	0	0	51	46	34	5	2	2
Oregon	0	1	59	58	2	7	0	1
California	8	9	227	206	5	5	4	13
Total	23	23	6,812	5,821	241	139	124	160

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Feb. 9, 1935, 10 cases, as follows: South Carolina, 1; Georgia, 2; Alabama, 1; Texas, 6.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January 1935										
Connecticut	2	23	626		2,144		1	252	0	6
Delaware		5	25		3		0	79	0	2
District of Columbia	5	31	88		52	1	1	109	0	3
Florida	2	34	251	16	113	3	1	47	0	4
Georgia	7	49	4,980	83	79	15	0	73	0	11
Indiana	5	202	687		1,744		0	793	10	12
Vermont		3			91		2	113	0	0

January 1935

	Cases
Actinomycosis:	
Connecticut	1
Chicken pox:	
Connecticut	888
Delaware	54
District of Columbia	317
Florida	184
Georgia	183
Indiana	529
Vermont	216
Conjunctivitis:	
Connecticut	1
Delaware	1
Georgia	1
Dengue:	
Florida	7
Georgia	55
Dysentery:	
Connecticut (bacillary)	8
Delaware	1
Georgia (amoebic)	4
Georgia (bacillary)	1
Epidemic encephalitis:	
Connecticut	1
Florida	1
Indiana	3

January 1935—Continued

	Cases
German measles:	
Connecticut	33
Delaware	8
Hookworm disease:	
Georgia	876
Lead poisoning:	
Connecticut	1
Mumps:	
Connecticut	193
Delaware	25
Florida	110
Georgia	104
Indiana	32
Vermont	6
Paratyphoid fever:	
Connecticut	1
Rabies in animals:	
Connecticut	1
Indiana	46
Screw-worm infection:	
Georgia	1
Septic sore throat:	
Connecticut	22
Georgia	30
Trachoma:	
Georgia	1

January 1935—Continued

	Cases
Trichinosis:	
Connecticut	3
Tularaemia:	
Georgia	1
Typhus fever:	
Florida	1
Georgia	14
Undulant fever:	
Connecticut	4
Delaware	1
District of Columbia	1
Georgia	3
Vermont	1
Whooping cough:	
Connecticut	359
Delaware	10
District of Columbia	25
Florida	72
Georgia	90
Indiana	174
Vermont	302

WEEKLY REPORTS FROM CITIES

City reports for week ended Feb. 2, 1935

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	0	4	2	0	0	0	9	28
New Hampshire:											
Concord	0	------	0	0	4	0	0	0	0	0	15
Nashua	0	------	0	0	0	0	0	0	0	0	------
Vermont:											
Barre	0	------	0	0	0	0	0	1	0	0	3
Burlington	0	------	0	0	0	9	0	0	0	0	8
Massachusetts:											
Boston	0	------	1	12	41	39	0	6	0	19	285
Fall River	0	------	0	305	2	0	0	1	0	9	31
Springfield	0	------	0	27	1	2	0	1	0	7	42
Worcester	0	------	0	0	13	8	0	2	0	11	56
Rhode Island:											
Pawtucket	1	------	0	0	0	0	0	0	0	0	13
Providence	1	------	0	8	8	7	0	4	0	12	83
Connecticut:											
Bridgeport	0	3	3	1	6	4	0	2	0	0	36
Hartford	2	2	0	122	3	8	0	2	1	11	42
New Haven	0	------	1	29	3	0	0	1	0	0	40
New York:											
Buffalo	0	------	2	135	27	56	0	13	1	23	153
New York	30	28	14	194	127	274	0	86	6	258	1,553
Rochester	0	------	0	144	4	11	0	0	0	10	80
Syracuse	0	------	0	1	3	8	0	1	0	25	49
New Jersey:											
Camden	2	1	0	0	3	2	0	6	0	0	35
Newark	0	17	1	18	6	15	0	5	0	33	91
Trenton	0	4	0	22	5	8	0	1	0	0	45
Pennsylvania:											
Philadelphia	7	8	7	8	47	89	0	22	2	145	522
Pittsburgh	2	19	11	106	24	22	0	5	1	19	213
Reading	1	------	1	6	1	6	0	0	0	27	15
Scranton	0	------	------	71	------	0	0	------	0	0	------
Ohio:											
Cincinnati	12	------	2	3	14	26	0	6	0	7	164
Cleveland	4	106	3	76	22	29	0	7	0	43	102
Columbus	7	3	3	50	10	29	0	2	0	2	104
Toledo	2	2	2	30	5	30	0	3	0	17	65
Indiana:											
Fort Wayne	3	------	2	0	6	7	0	0	0	0	28
Indianapolis	10	------	2	2	17	21	0	6	0	8	------
South Bend	0	1	1	57	3	4	0	0	0	0	14
Terre Haute	0	1	1	0	8	1	0	1	0	2	31
Illinois:											
Chicago	6	13	6	308	59	441	0	35	0	84	728
Springfield	0	1	0	1	10	9	0	0	0	3	27
Michigan:											
Detroit	5	22	3	190	28	142	0	13	1	68	259
Flint	0	------	0	72	9	8	0	0	0	6	32
Grand Rapids	0	------	1	27	0	12	0	1	0	8	41
Wisconsin:											
Kenosha	0	------	0	86	0	33	0	1	0	21	9
Milwaukee	0	2	0	254	7	322	0	7	0	46	100
Racine	0	------	0	4	1	7	0	1	0	4	12
Superior	0	------	1	27	1	0	0	0	0	0	9
Minnesota:											
Duluth	0	------	0	320	2	0	0	0	0	0	20
Minneapolis	1	------	0	1,749	12	44	0	2	2	11	120
St. Paul	0	2	2	12	6	24	2	2	0	9	62
Iowa:											
Davenport	3	------	------	12	------	1	0	------	0	0	------
Des Moines	2	------	------	24	------	11	0	------	0	0	44
Sioux City	2	------	------	7	------	0	0	------	0	2	------
Waterloo	1	------	------	9	------	10	0	------	0	1	------
Missouri:											
Kansas City	1	------	0	40	22	13	0	5	0	2	123
St. Joseph	1	------	0	6	10	3	0	3	0	1	62
St. Louis	------	------	------	------	------	------	------	------	------	------	------

City reports or week ended Feb. 2, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
North Dakota:											
Fargo	0	------	0	------	1	6	0	0	0	1	4
Grand Forks	0	------	------	------	------	7	0	------	0	0	------
South Dakota:											
Aberdeen	0	------	------	18	------	0	0	------	0	5	------
Sioux Falls	0	------	------	0	------	0	0	------	0	0	8
Nebraska:											
Omaha	2	------	0	8	14	17	1	2	0	0	73
Kansas:											
Topeka	0	------	1	4	11	4	0	0	0	4	37
Wichita	1	------	0	76	6	2	0	1	0	3	33
Delaware:											
Wilmington	1	------	0	1	2	2	0	3	0	0	30
Maryland:											
Baltimore	0	17	6	9	31	71	0	13	0	14	248
Cumberland	0	------	1	16	0	3	0	1	0	0	14
Frederick	0	------	0	0	3	0	0	1	0	0	7
District of Columbia:											
Washington	7	4	5	7	20	22	0	9	1	2	161
Virginia:											
Lynchburg	3	------	0	283	3	2	0	0	0	1	12
Norfolk	7	1	0	12	3	3	0	1	0	13	32
Richmond	0	------	0	71	1	5	0	4	0	0	58
Roanoke	0	------	2	5	2	2	0	2	0	0	18
West Virginia:											
Charleston	2	------	0	12	2	1	0	0	0	5	19
Huntington	3	------	------	3	------	2	0	------	0	0	------
Wheeling	0	------	1	10	6	34	0	1	0	8	26
North Carolina:											
Raleigh	------	------	------	------	------	------	------	------	------	------	------
Wilmington	0	------	0	1	3	0	0	1	0	0	15
Winston-Salem	1	3	2	1	4	2	0	0	0	37	21
South Carolina:											
Charleston	0	59	1	0	1	0	0	0	0	0	30
Columbia	0	------	0	0	4	0	0	0	0	0	15
Greenville	0	------	0	0	2	0	0	1	0	1	18
Georgia:											
Atlanta	5	38	3	0	12	6	0	3	0	17	90
Brunswick	0	1	1	0	1	0	0	0	0	0	9
Savannah	0	40	1	0	5	1	0	1	0	0	35
Florida:											
Miami	0	2	1	0	1	0	0	2	0	0	29
Tampa	0	2	2	0	0	7	0	2	0	0	32
Kentucky:											
Ashland	1	------	------	0	------	1	0	------	0	0	------
Lexington	0	7	0	10	5	1	0	1	0	0	21
Tennessee:											
Memphis	4	------	1	0	12	2	0	3	0	1	85
Nashville	2	------	4	2	5	5	0	2	0	4	61
Alabama:											
Birmingham	0	70	5	13	13	5	0	4	2	2	85
Mobile	0	8	2	0	3	1	0	1	0	1	29
Montgomery	0	6	------	3	------	0	0	------	1	0	------
Arkansas:											
Fort Smith	0	------	0	0	------	1	0	------	0	1	------
Little Rock	2	------	1	2	3	2	0	2	0	0	------
Louisiana:											
New Orleans	25	8	3	11	19	8	0	10	1	0	153
Shreveport	0	------	0	14	9	6	0	2	0	0	41
Oklahoma:											
Oklahoma City	1	------	0	0	9	4	0	2	0	0	58
Texas:											
Dallas	5	9	0	------	17	7	0	1	2	0	83
Fort Worth	3	------	0	0	3	2	0	0	0	0	34
Galveston	10	------	0	0	1	1	1	0	0	0	19
Houston	5	------	3	1	17	15	1	7	0	0	91
San Antonio	3	------	3	1	7	0	0	8	0	0	77
Montana:											
Billings	0	------	0	14	0	1	0	0	0	0	5
Great Falls	0	------	0	------	2	0	1	0	0	0	13
Helena	0	------	0	56	0	0	0	0	0	1	4
Missoula	0	30	0	------	6	0	0	0	------	0	14
Idaho:											
Boise	0	------	0	0	2	1	0	0	0	0	8

City reports for week ended Feb. 2, 1935—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Colorado:											
Denver	6	41	4	368	14	167	1	5	0	0	79
Pueblo	2	------	3	41	3	2	0	0	1	0	15
New Mexico:											
Albuquerque	2	------	0	5	3	0	0	4	0	8	13
Utah:											
Salt Lake City	1	------	0	4	7	70	0	1	0	37	30
Nevada:											
Reno	0	------	0	0	0	2	0	0	0	0	6
Washington:											
Seattle	------	------	------	------	------	------	------	------	------	------	------
Spokane	0	1	1	218	5	10	0	1	0	0	33
Tacoma	0	------	0	4	3	1	15	0	0	1	23
Oregon:											
Portland	0	3	1	36	6	7	0	2	0	0	79
Salem	0	3	------	0	------	1	0	------	0	0	------
California:											
Los Angeles	20	277	6	11	29	64	8	18	0	10	388
Sacramento	11	------	0	8	6	2	0	2	0	2	40
San Francisco	1	53	2	4	21	21	0	11	0	4	194

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
New York:			
New York	3	4	0
New Jersey:			
Newark	1	1	0
Pennsylvania:			
Philadelphia	2	1	0
Pittsburgh	1	0	0
Ohio:			
Cincinnati	6	1	0
Illinois:			
Chicago	8	2	0
Wisconsin:			
Milwaukee	1	0	0
Minnesota:			
St. Paul	1	0	0
Iowa:			
Des Moines	1	0	0
Missouri:			
Kansas City	1	1	0
St. Joseph	3	1	0
Nebraska:			
Omaha	0	2	0
Maryland:			
Baltimore	3	1	0
District of Columbia:			
Washington	8	0	1
Virginia:			
Richmond	0	2	0
West Virginia:			
Charleston	1	0	0
Wheeling	0	1	0
Kentucky:			
Lexington	1	1	0
Tennessee:			
Memphis	4	1	0
Nashville	0	1	0
Arkansas:			
Little Rock	2	1	0
Louisiana:			
New Orleans	0	1	0
Oklahoma:			
Oklahoma	2	1	0
Utah:			
Salt Lake City	1	0	0
Oregon:			
Portland	1	0	0
Salem	0	0	1
California:			
Los Angeles	0	0	7
Sacramento	1	1	1
San Francisco	1	0	0

Dengue: Miami, 1 case.
Epidemic encephalitis.—Cases: New York, 3; Philadelphia, 1; Norfolk, 5.
Pellagra.—Cases: Winston-Salem, 1; Atlanta, 1; Dallas, 1; San Francisco, 1.
Typhus fever.—Cases: New York, 1; Baltimore, 1; Charleston, S. C., 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended January 26, 1935.—During the 2 weeks ended January 26, 1935, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis		2			4				2	8
Chicken pox		3	5	408	635	126	150	18	142	1,577
Diphtheria		6		27	26	23				82
Dysentery				2						2
Erysipelas				17	5	5	2	1		30
Influenza		7		7	159	2			20	195
Measles		246	238	692	1,283	730	1,016	31	24	4,260
Mumps		31			428	45	1	5	41	551
Pneumonia		4			32				44	80
Poliomyelitis				1	2				1	4
Scarlet fever		11	28	276	404	41	23	22	54	859
Trachoma									2	2
Tuberculosis	2	2	13	101	113	16		3	21	271
Typhoid fever		1	1	46	2	2		1		53
Undulant fever				1	1					2
Whooping cough		2	256	295	265	74	55	6	51	1,004

ITALY

Communicable diseases—4 weeks ended August 19, 1934.—During the 4 weeks ended August 19, 1934, certain communicable diseases were reported in Italy, as follows:

Disease	July 23–29		July 30–Aug. 5		Aug. 6–12		Aug. 13–19	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	41	31	34	31	32	24	32	29
Cerebrospinal meningitis	7	7	13	11	10	9	8	7
Chicken pox	146	79	90	70	78	49	90	50
Diphtheria and croup	342	195	290	290	309	196	407	209
Dysentery	49	21	23	15	54	29	43	27
Lethargic encephalitis	1	1			2	2	2	2
Measles	1,201	283	842	237	785	227	589	196
Poliomyelitis	34	27	36	30	26	23	26	15
Scarlet fever	210	98	151	82	169	91	239	109
Typhoid fever	921	459	927	480	956	521	1,209	552

PUERTO RICO

Notifiable diseases—4 weeks ended January 26, 1935.—During the 4 weeks ended January 26, 1935, cases of certain notifiable diseases were reported in Puerto Rico, as follows:

Disease	Cases	Disease	Cases
Chicken pox	48	Ophthalmia neonatorum	1
Diphtheria	39	Pellagra	2
Dysentery	25	Poliomyelitis	6
Erysipelas	1	Ringworm	2
Filariasis	1	Syphilis	34
Framboesia	10	Tetanus, infantile	3
Influenza	37	Tuberculosis	572
Malaria	1,402	Typhoid fever	11
Measles	34	Whooping cough	273
Mumps	65		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following table must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		July 1–28, 1934	July 29–Aug. 25, 1934	Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Week ended— November 1934 3	November 1934 10	November 1934 17	November 1934 24	December 1934 1	December 1934 8	December 1934 15	December 1934 22	December 1934 29	January 1935 5	January 1935 12	January 1935 19	January 1935 26
China:																		
Amoy	C	[1] 1																
Hankow	C	2																
Shanghai	C	2	1															
India	C	39,308	58,347	53,096	19,160	3,233	3,563	4,724	4,658	5,069	5,640	2,974	1,962					
	D	21,179	29,499	26,643	9,524	1,627	1,943	2,494	2,495	2,547	2,829	1,197	1,009					
Assam	C				43	39	17	56	215	105	243	297						
	D					18	8	21	86	64	83	127						
Bassein	C									1	1	4	5	4	2	2	2	2
	D											2	4	3	2	3	1	3
Bombay Presidency	C	2,985	11,334	5,974	1,973	270	120	256	217	205	181	117		33	26			
	D	1,005	4,125	2,355	925	105	66	115	97	70	88	50		17	16			
Bombay	C	1	1	2														
Calcutta	C	294	182	183	110	28	15	18	17	25	10	46	36	49	53	30	30	61
Chittagong	C	9	2	1	1				1	1	3	3	1	4				
Madras Presidency	C	2,463	6,883	3,647	1,098	300	418	511	672	998		2,452						
	D	1,093	3,184	1,695	526	134	203	255	303	469		1,201						
Madras	C	5	145	60	7	16	27	14	2	3	3	8	5	8	2	5	9	9
	D	3	55	29	5	3	14	13	2	1		3	4	4	1	5	4	7
Porto Novo	C												P					
Moulmein	C																	1
Negapatam	C					[2] 1										12		
Punjab	C			35														
	D			25														
Rangoon	C			1						1						2	1	18
Tuticorin	C																1	
Vizagapatam	C		4	6														
India (French):																		
Chandernagor	D	6		1	1													
Karikal	C	1	16	47	5			2					4	7				
Pondichery	C	6	106	59		10					2	3	3	21				

[1] Suspected.
[2] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

[C indicates cases; D, deaths; P, present]

Place		July 1-28, 1934	July 29-Aug. 25, 1934	Aug. 26-Sept. 29, 1934	Sept. 30-Oct. 27, 1934	Week ended— November 1934				December 1934					January 1935			
						3	10	17	24	1	8	15	22	29	5	12	19	26
Indo-China (see also table below):																		
Kandal	C															2		
Pnom-Penh	C		2									1	1					
	D	1																
Siam	C	1																
On vessels:																		
S. S. *Khostan* at Calcutta from Karachi	C	1																
S. S. *Erinpura* at Port Swettenham	C		1															
S. S. *Aronda* at Rangoon from Calcutta	C			1														

Place		July 1934			August 1934			September 1934			October 1934			November 1934	
		1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20
Indo-China (French) (see also table above):															
Cambodia [3]	C	1	1		2						1			3	
	D	1	1		1						1			3	
Cochin-China [3]	C	4	2	6	1		2			1				1	2
	D	4	2	4	1		1			1				1	2

[3] Reports incomplete.

PLAGUE [1]

[C indicates cases; D, deaths; P, present]

Place		July 1–28, 1934	July 29–Aug. 25, 1934	Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Week ended— November 1934: 3	10	17	24	December 1934: 1	8	15	22	29	January 1935: 5	12	19	26
Argentina (see also table below): Santiago de Estero Province—Frias	C										1							
Azores. (See table below.)																		
Belgian Congo	C	8					8	2	4						1	2		
Brazil:																		
Alagoas State	C											5						
	D											2						
Ceara State	C										2							
British East Africa (see also table below):																		
Kenya	C	1	5	13	1	1	2	2		1	3				17			
Uganda	C	131	101	70	89	18	16	23	22	33	13	16	38	22				
	D	122	101	69	85	16	16	21	22	34	13	16	33	18				
Ceylon: Colombo	C	1		1				1	1					1				
	D	1						1	1	1								
Plague-infected rats				1		3												
China (see also table below):																		
Fort Bayard [2]																		
Manchuria [3]	D	22	8															
Mansantun [4]	D													4				
Dutch East Indies:																		
Java—Batavia	C				5													
	D				5													
West Java	C	1,148	1,721	2,201	1,684	453	402	390										
	D	1,144	1,720	2,201	1,684	453	402	390										
Egypt:																		
Alexandria—Plague-infected rats		P	P	P	P		P		P		P		P		P			
Asyut	C								2									
Beni-Suef	C					1												
Gharbiya	C	22																
	D	6																
Girga	C																	1

[1] Including plague in the United States and its possessions.
[2] During the week ended June 2, 1934, suspected cases of plague were reported in Fort Bayard, Kwangchowan Territory, China.
[3] A report dated Oct. 30, 1934, states that from June to Oct. 25, 1934, deaths from plague had been reported in Manchuria, China, as follows: Fengtien Province—Liaoyuan 30, Shuangshan 21, Tungliao 41; Kirin Province—Changling 12, Chienan 26, Fuyu 32, Hsinking City 1, Nungan 168.
[4] Up to Jan. 5, 1935, 44 cases of plague with 35 deaths were reported at Mansantun, Manchuria, China.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		July 1–28, 1934	July 29–Aug. 25, 1934	Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Week ended— November 1934 3	10	17	24	December 1934 1	8	15	22	29	January 1935 5	12	19	26
Hawaii Territory:																		
Hawaii Island—Hamakua district—																		
Kalopa—Plague-infected rats					1	1			2									
Paauhau	C					1												
	D					1												
Plague-infected rats					1													
Pohakea—Plague-infected rats					1													
Maui Island—Makawao district—																		
Kahului (9 miles from)—Plague-infected rats					2													
Paia—Plague-infected rats					1													
India	C	921	3,032	6,640	5,642	1,117	826	1,043	1,181	1,059	964	817	865					
	D	578	1,777	3,981	3,114	607	509	613	695	597	587	521	532					
Bassein	C	5	5	1	2		2	1						1				
Plague-infected rats		1	3	3	1				1									
Bombay Presidency	C	379	1,464	2,929	2,759	741	406	485	461	372	300	220		214	232			
	D	220	842	1,760	1,626	278	235	286	310	230	176	134		137	138			
Bombay	C	1		1													1	
Plague-infected rats				2	1													
Madras Presidency	C	194	333	553	309	45	19	55	111	119		63						
	D	98	105	296	183	19	10	21	42	63		24						
Moulmein	C		1															
	D		1															
Punjab	C				29	13	8	29	3	10	17	8	11	13	9	5	11	
	D				17	8	6	20	1	8	13	7	6	11	5	2	5	
Rangoon	C	1	1	3											1			
Plague-infected rats			1							1								
Indo-China (see also table below):																		
Bentre	C		1															
Pnom-Penh	C		1	3	2				1			1	1					
Saigon and Cholon	C	1	1	1			1	1										
Iraq: Baghdad	C	1																
Madagascar. (See table below.)																		
Morocco: Tangier	C					4	3											
Peru (see also table below).																		

Senegal. (See table below.)																		
Siam:																		
Prachin—Nagara Nayok	C													4				
Rajpuri	C														1			
South-West Africa.[5]																		
Union of South Africa: Orange Free State	C				3			2	1				2					
United States: California: Plague-infected ground squirrels: Modoc County		2																
On vessel: S. S. *Barjora* at Rangoon from Moulmein	C			1														
	D			1														

Place		July 1934	August 1394	September 1934	October 1934	November 1934	December 1934
Argentina (see also table above)	C	2	6	11			
Azores	C	5	5	2			
British East Africa (see also table above):							
Kenya	C		13	5	1	6	
Uganda	C		103	54			
China: Kwangchowan	C	10	3			3	
	D	4	3			3	
Indo-China (see also table above):							
Cambodia	D	2	3	3	4	4	
Cochin-China	C	8	2	1		2	

Place		July 1934	August 1934	September 1934	October 1934	November 1934	December 1934
Madagascar (central region)	C	97	160	291	444	431	381
	D	96	158	283	422	410	364
Peru (see also table above)	C		1			2	5
Lima department	C			2	3	1	1
Senegal:							
Dakar [6]	C	55	52	17	13	4	2
	D	47	47	19	11	3	2
Diourbel [6]	C		5	1			
	D		3	1			
Rufisque [6]	C	33	42	18	8	4	
Theis [6]	C	50	39	6	6		
Tivaouane [6]	C	27	82	26	21	3	1

[5] From January to June 30, 1934, 20 cases of plague were reported in Ovamboland, South-West Africa.
[6] Reports incomplete.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		July 1–28, 1934	July 29–Aug. 25, 1934	Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Week ended— November 1934 3	Nov. 10	Nov. 17	Nov. 24	December 1934 1	Dec. 8	Dec. 15	Dec. 22	Dec. 29	January 1935 5	Jan. 12	Jan. 19	Jan. 26
Algeria:																		
Algiers Department	C	1			1													
Constantine Department	C			1	1													
Angola. (See table below.)																		
Belgian Congo (see also table below)	C	1	2	5			102											518
Bolivia. (See table below.)																		
Brazil:																		
Porto Alegre (alastrim)	C	2	5	2	1													
Recife	C											1						
Sergipe State	C						P											
British East Africa:																		
Kenya	C	93	169	116	30	11	1	4	1	5	5			2				
Tanganyika	C	2	6	43	18		12	2		20	19	15	5	4				
British Somaliland	C	16		7	7	2			3									
British South Africa:																		
Northern Rhodesia	C			16														
Southern Rhodesia	C		2	1	2					1								
Cameroun (French). (See table below.)																		
Canada:																		
Alberta	C							1	1	1								
British Columbia	C		[1] 1															
Manitoba	C			[1] 1	[1] 1													
Saskatchewan	C				2	[1] 1												
Canary Islands: Santa Cruz de Tenerife	C									2	1							
Ceylon: Colombo	C			17	3	2	1	3	5		10	1	1		1	1	10	3
China:																		
Amoy	C	6	3			1									1			
Canton	C						1		2		2	3		4	1	3	2	1
Dairen	C	6		2						1								
Foochow	C	P	P	P	P	P		P		P		P		P		P		
Hangchow	C	2																
Hankow	C			1	1				1	1	1		4	9				
Hong Kong	C			1		1		[2] 1					1	1	1	2	1	4
Macao	D					1		1	1	4	10	4	15	10	12	17	13	5
Nanking	C											1						
Shanghai	C	8	3	1	2				1		2	3	1	2				

Swatow	C		1															
Tientsin	C	2			2		2		1	1	1	3						
Tsingtao	C		1		1			2	1					2				
Chosen. (See table below.)																		
Colombia	C															[1] 11		
Dahomey. (See table below.)																		
Ecuador. (See table below.)																		
Egypt:																		
Alexandria	C		2															
Aswan	C	4																
Cairo	C	1	4	1														
Faiyum	C	2		1														
Girga	C	4																
Minya	C	15	3	2														
Sharkiya	C				74													
Provinces	C	39	31	13	46	3							2					
Eritrea	C		1															
Finland. (See table below.)																		
Formosa	C															P		
France. (See table below.)																		
Great Britain:																		
England and Wales	C	3		1	1		1											
London	C				1													
London and Great Towns	C			1	1													
Greece: Salonika	C	7	8		3													
Guatemala. (See table below.)																		
Honduras:																		
Tegucigalpa	C		4	2														
Tela	C										5	1	1		1		1	
India	C	16,344	12,684	8,838	4,421	1,365	1,555	1,856	2,387	2,782	3,147	3,473	3,544					
	D	3,966	3,269	2,108	546	261	318	370	482	509	920	862	883					
Bassein	C	1	1															1
	D	1	1															2
Bombay Presidency	C	1,000	1,134	1,102	628	267	130	346	502	413	473	602		559	704			
	D	249	237	200	132	34	12	72	86	67	113	107		142	173			
Bombay	C	5	4	14	8	1	1	3			4	1	8	9	7	28	23	29
	D	2	3	6	5	1	1	2			2		3	6	5	12	15	9
Calcutta	C	23	7	16	3			4			5	10	22	14	14	12	19	34
	D	18	8	9				1			3	5	15	9	10	9	11	22
Cochin	C																2	
Karachi	C	13	6	3									4	3		6		5
Madras Presidency	C	3,576	3,397	2,920	2,708	658	739	685	671	989		950						
	D	568	616	515	414	96	94	123	133	132		153						
Madras	C	34	19	22	16		2	1	2		7	8	2	2	5	7	12	12
Negapatam	C	7	4	3	8		1	1	1		2	10	2	10	9	10	6	8
Punjab	C				5	11	20	16	13	21	80	38	86	50	127	43	73	
Rangoon	C	6	3	2	3		2	1			1			2	2	4	10	10
Tuticorin	C	6		3	2						2	1					3	1
Vizagapatam	C	3	8	1				5	11		11	8	5	4	54	4	11	23

[1] For 2 weeks.
[2] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 1-28, 1934	July 29-Aug. 25, 1934	Aug. 26-Sept. 29, 1934	Sept. 30-Oct. 27, 1934	Week ended— November 1934				December 1934					January 1935			
						3	10	17	24	1	8	15	22	29	5	12	19	26
India (French):																		
Chandernagor	D	1	2	1														
Karikal	C			1	1			1		2		1	1	9				
Pondichery	C	131	170	236	99	35		36	18	34	30	7	34	27				
	D	78	103	147	81	10		19	16	22	31	6	20	20				
India (Portuguese)	C		27															
Indo-China (see also table below):																		
Haiphong	C			1											1			
Pnom-Penh	D		1															
Tourane	C	17	9	3	4		3			1			1	3	1	1		
Iraq	C	13	5	11	3				1	10		8	13	2				
Arbil	C	15		6	2					1				2				
Baghdad	C		2	[2] 1	1													
Basra	C										1		5					
Italy:																		
Genoa	C		8	2														
Milan	C			2														
Ivory Coast. (See table below.)																		
Japan	C	6						1		26	55	33						
Aomori Prefecture	C	3																
Kobe	C	1																
Liberia.[3]																		
Mexico:																		
Allende.[4]																		
Chihuahua	C	1		1			2			1	2	2	7	5		5	1	1
Mazatlan.[5]																		
Mexico, D. F.	C	5	6	8	6					1			6					
Monterrey	C		1															
San Luis Potosi	D	1								1								
Teitipac.[5]																		
Morocco. (See table below.)																		
Mozambique. (See table below.)																		
Nigeria	C		239	215	159		115				112		74					
Lagos	C	2	3	5														
Nyasaland. (See table below.)																		
Palestine	C									1								2
Persia	C	2	3	2	7	1	3			1								
Teheran	C	7	1				1	1		1	1							
	D			1	1	1												
Peru. (See table below.)																		

Poland	C	[illegible]		[illegible]	[illegible]			[illegible]										
Portugal (see also table below):																		
Lisbon	C	4			2	1	1							1				
Oporto	C			1		1						1						
Portuguese East Africa. (See table below.)																		
Salvador	C	[1] 21	30	12	13	9			1			[6] 27	1					
Siam	C	6		32	4	13							20		8	3	12	1
Sierra Leone	C	67	80	385	214		[1] 60				[1] 129		[1] 43					
Somaliland (French): Jibuti	C																5	
Spain	C	54	47	29	22	36	54	8	7	7	29	15	14	13	7	4		
Straits Settlements: Singapore	C				2													
Sudan (Anglo-Egyptian)	C	8	4	1	1				1			1		11	2	5	5	1
Syria:																		
Beirut	C		2															
Damascus	C							26	7	26	19		4			6		
Provinces	C	50	32	78	51	15	35	39	27	49	30		18	17	1	18	9	
Trans-Jordan	C	1					[2] 1											
Tunisia	C															5		
Turkey. (See table below.)																		
Union of South Africa	C	P	P	P														
Union of Soviet Socialist Republics. (See table below.)																		

On vessels:
- S. S. *Rohna* at Penang from Madras — 1 case — July 12, 1934
- S. S. *Tacoma* at Moji from Dairen — 1 case — July 28, 1934
- S. S. *Ethiopa* at Rangoon from Madras — 1 case — Sept. 3, 1934
- S. S. *Ussuri Maru* at Kobe from Dairen — 1 case — Sept. 24, 1934

On vessels—Continued.
- S. S. *Rohna* at Penang from Madras — 1 case — Oct. 4, 1934
- S. S. *Erinpura* at Rangoon from Madras — 1 case — Oct. 8, 1934
- S. S. *Kiang Si* at Jibuti — 1 case — Nov. 21, 1934
- S. S. *Varela* at Basra — 1 case — Dec. 5, 1934

Place		July 1934	August 1934	September 1934	October 1934	November 1934	December 1934
Angola	C	72	65				
Belgian Congo (see also table above)	C	360	204	183	184	110	
Bolivia	C	82	136	70			
Cameroun (French)	C	1					
Chosen	C	18	5	15	40	38	
Dahomey	C	83	31	10	6	1	
Ecuador	C	1					
Finland	C	1					
France	C		3	2	3	53	57
Guatemala	C		1		2	1	2
Indo-China (see also table above)	C	192	150	87	202	259	280
	D	29	39	18	39	22	25

Place		July 1934	August 1934	September 1934	October 1934	November 1934	December 1934
Ivory Coast	C	2					
Morocco	C	5	2	8		7	5
Mozambique	C	3	4	6	1	36	
Nyasaland	C	31	16	20	17	29	11
Peru	C	24	100	12			
Portugal (see also table above)	C	70	60	36			
	D	4	6	2	21		
Portuguese East Africa	C	3	4	6	1	36	
Turkey	C	17	4	16	2		
Union of Soviet Socialist Republics	C	358	408				

[1] For 2 weeks.
[2] Imported.
[3] A report states that from February to Sept. 10, 1934, 233 cases of smallpox, with 79 deaths, had been reported in Sanoyea, Liberia. All sanitary measures have been taken.
[4] A report dated Dec. 28, 1934, states that about 48 cases of smallpox, with 5 or 6 deaths, had been reported at Allende, Mexico.
[5] A report dated Aug. 27, 1934, states that smallpox has appeared in the suburbs of Mazatlan, Sinaloa, Mexico; the report also states that 104 deaths from smallpox have occurred in Teitipac, Oaxaca, Mexico.
[6] For 3 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		July 1–28, 1934	July 29–Aug. 25, 1934	Aug. 26–Sept. 29, 1934	Week ended— October 1934: 6	13	20	27	November 1934: 3	10	17	24	December 1934: 1	8	15	22	29	January 1935: 5	12	19
Algeria:																				
Algiers Department	C	1	1		1			3	2	1	1				2			2	1	1
Constantine Department	C	32	12	5	1			3					1			8	5	3	4	2
Bone	C		1	1																
Constantine	C							2				2	1						1	
Oran Department	C	2	10										1	1						
Basutoland	C			20	17	12	7	10												
Belgian Congo	C	135	108	62	4	7	6	3	4	4	1	3		2		2		1	3	
Bolivia. (See table below.)																				
British East Africa: Uganda	C		1						10					1						
Bulgaria	C	2					2	5			5	2		4	3	4				
Chile	C	1,180	1,188	1,408																
Concepcion	C	13		14																
Iquique	C				[1] 4															
Santiago	C	365	185	430																
Tarapaca Province.[2]																				
Tocopilla	C			1																
Valparaiso	C	30	21	21		6	3	8	10	9	6	8	16	15	15	8	14	4	11	6
China:																				
Hankow	C				1															
Shanghai	C			1										2			1			
Chosen. (See table below)																				
Czechoslovakia. (See table below.)																				
Egypt:																				
Alexandria	C	2	1				1								1				1	
Aswan	C											2	2	1						
Asyut	C	1																		
Beheira	C	52	31	1									3		2	4	8	8	14	
Cairo	C	2										1					1		1	
Dakahliya	C	17	7									1							4	
Damietta	D	1				1									1					
Faiyum	C					1														
Gharbiya	C	71	22	3		1						6		1		2	3		4	
Girga	C		1																1	
Minufiya	C	26	5								4	11	4	2	3	11	1	1	2	
Minya	C		1																	
Port Said	C									1		1				1	1			
Qena	C	1	6			1	2					1		2	2		2			
Sharkiya	C	15	3	1										1					1	
Provinces	C	176	98	35	2	3	3	2	2		5	22	9	7	9	18	16	9	27	

Estonia	C		1																	
Greece (see also table below): Salonika	C		6	2	1	1		1	1	1	1	1	1	1	1	1	1			
Guatemala. (See table below.)																				
Hungary	C			1									6		1		1			1
Iraq:																				
Baghdad	C		3	1	1									1						
Mosul liwa	C	14	3	3																
Irish Free State:																				
Cork County—Castletown	C	5																		
Waterford County—Lismore	C			1	1															
Wicklow County—Altidore	C	7																		
Italy:																				
Leghorn	C		2	4				1												
Palermo	C	1																		
Japan:																				
Aomori Prefecture	C		3	1																
Kobe	C				1															
Nagasaki	D			1																
Latvia. (See table below.)																				
Lithuania	C	17	7	2		2		1		1			1	8	4		3	3	7	
Mexico:																				
Guadalajara	D			1																
Mexico, D. F	C	38	34	26	8	6							3	18	7	8				
Saltillo	D			2		1														
San Luis Potosi	D	1			1		1													
Torreon	C	1	1			1		4			1					1	1			
Morocco	C	16	43	1					1				7	2	6	1	1		3	3
Palestine	C	5	1	3	1	1	2											2		
Haifa	C	[1]1	1	1	1	[1]1	[1]1	[1]1			[1]2	[1]2		2		1	1			
Persia	C	112	49	47	4	8		7	10	5		3	5	10	25	19	9	22		
Teheran	C	25	7	10	1															
Peru. (See table below.)																				
Poland	C	148	77	53	13	9	13	13	14	12	16	19	27	12	38	33	14			
	D	12	6	1	3	1		1	2	1	3	3	4	3	1	1	1			
Portugal (see also table below):																				
Oporto	C	1		1										2						
Tarouca (near)	C																		26	
Rumania. (See table below.)																				
Spain	C			1																
Straits Settlements: Singapore	C	2																		
Syria: Beirut	C		1																	
Trans-Jordan	C	4	4																	
Tunisia:																				
Tunis	C	1	1			1			1				3				1			
Provinces	C	46	14	18	2		4	16	18	1	14	2	10	1	8	21	16	9	2	18
Turkey. (See table below.)																				
Union of South Africa. (See table below.)																				
Union of Soviet Socialist Republics. (See table below.)																				
Yugoslavia. (See table below.)																				

[1] Imported.

[2] A report dated July 13, 1934, states that 41 cases of typhus fever with 7 deaths have been reported in the villages of Usmagama and Pachica, Tarapaca Province, Chile.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		July 1934	August 1934	September 1934	October 1934	November 1934	December 1934
Bolivia	C	39	91	33			
Chosen	C	41	23	7	22	41	
Czechoslovakia	C	3					7
Greece	C	9	10	7	6	5	
Guatemala	C	24	30	31	18	18	21
Latvia	C				3		
Peru	C	43	24	03			
Portugal	C		4	7			
Rumania	C	16	24	16	48	85	
Turkey	C	9	22	10	16	20	3
Union of South Africa:							
Cape Province	C	289	272	437	407	223	
Natal	C	26	15	6	29	4	
Orange Free State	C	709	510	492	403	309	
Transvaal	C	24	12	105	32	39	
Union of Soviet Socialist Republics	C	1,343	1,297				
Yugoslavia	C	58	27	12	31	3	17

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		July 1-28, 1934	July 29-Aug 25, 1934	Aug. 26-Sept. 29, 1934	Week ended— Oct. 1934: 6	13	20	27	Nov. 1934: 3	10	17	24	Dec. 1934: 1	8	15	22	29	Jan. 1935: 5	12	19
Brazil:																				
Amazonas State—Fonte Boa	C	1																		
Ceara State:																				
Ignatu	D	1	1																	
Novo Oriente	C	1																		
Mato Grosso State: Coronel Ponce.[1]																				
Colombia: Intendencia of Meta—Restrepo	D											3						1		
French West Africa—Guinea—Kindia	C			1																
Gambia:																				
Bathurst	C										1					2		1		
St. Mary's Island	C										[2] 2									
Gold Coast:																				
Aperadi	C																		2	1
	D																		1	
Kokobee	C											1								

N'Kaw Kaw	C	1																		
Oda	C																		1	
Ivory Coast:																				
Abidjan	C			1																
	D	1		1																
Agboville	C			1																
Banguoanou.[3]																				
Bingerville	C		1																	
Bobo-Diolasso	D						[2] 1													
Dibro	C													3						
	D													1						
Diekekro	C														1					
Dimbokro	C																			1
Tirailleur	C							1												
Toumodi	C													15			1			
	D													10						
Zuanoula	C													1						
Nigeria: Kano	C														2			1		
Niger Territory:																				
Maradi	C			1																
Zinder	C	1	5			1													1	
	D	1	4			1														
Sierra Leone: Hill Station (near Freetown)	C																		[1] 1	

[1] During the month of October 1934, 1 case of yellow fever was reported at Coronel Ponce, Mato Grosso State. Brazil.
[2] Suspected.
[3] For the week ended Feb. 2, 1935, 1 case of yellow fever with 1 death was reported at Bangouanou, Ivory Coast.

X

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HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

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PUBLIC HEALTH REPORTS

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PURPOSE AND FUNCTION OF SCHOOL HEALTH RECORDS

By EARL E. KLEINSCHMIDT, M. D., *Department of Hygiene and Public Health, University of Michigan*

An inquiry into school health records and systems of record-keeping in various school health services in this country reveals a wide diversity of methods. One can scarcely find two cities with similar systems; yet, in principle, there may be considerable correlation. Undoubtedly much of this is due to the tendency of many school systems to adopt record forms and systems of record-keeping found practical in the older school health services in the East, notably those in cities in New York and Massachusetts. To enumerate and describe record systems now in use would require considerable space. It is proposed instead, in this short discussion, to review in principle the purposes of school health records, to summarize briefly source materials, and to state some of the writer's experiences in setting up purposes and methods of record keeping in the furtherance of accepted objectives of a school health program.

Any social activity, whether it be that of a school health service or a particular business, must have a record system to aid in furthering its objectives and measuring the results of its activities. Much of the success of school health work, its administrative control, results obtained, and tabulation of valuable statistics, depend on the merits of the record system. It is to school health work what careful bookkeeping is to the merchant. Adequate health records are the medium of cooperation between school physician, nurse, teacher, and parent. It, therefore, behooves the director of health activities to facilitate this cooperation between all parties concerned.

Inasmuch as school health work, to a large extent, centers around the school health-examination program and its relationship to the health instruction and supervisory programs, much of this discussion must necessarily be based thereon. To carry out an adequate school health examination, the school physician must establish purposes, standards, and techniques, by which the public may judge the nature of his activities. It is his standards, after all, which determine the effectiveness of school medical work, although it is realized that many school physicians have no voice in the matter.

In States having mandatory school health legislation the nature of the school physician's activities and the record systems are, to a large extent, determined for him by the nature of the legislation.

How closely he follows the implications of the legal statutes depends on their nature, i. e., whether they are mandatory or permissive. Obviously the best correlation of school health methods can eventuate only when comprehensive permissive laws are established for the whole field of school health supervision in all States.

By virtue of the fact that the school health program is primarily informative or educational in nature, any system of records must serve both educational and scientific ends. Their function must be broad enough to fit in with the broad purposes of education and yet permit of reasonable scientific comparisons. Generally speaking, school health examinations are no longer being performed in a hurried mass-production style, a method which is distasteful to the well-trained physician. Hence record systems must be adequate for more careful examinations. There are still, however, many limitations to careful work by the school physician. Lack of sufficient health history, of necessary clinical data as results of laboratory tests, and often inadequate clinical facilities make for poor results of school medical work. Despite these drawbacks one cannot overlook the many educational values of carefully kept records of available health information.

School health records are a functional part of school systems which aim to carry out in practice the objectives of modern education. In these schools classroom teachers are copartners with physician and nurses in the school health program. Health information, brought to light by the school physician concerning the student body, constitutes an important index of progress and is valued accordingly by these teachers who are alert to the meaning of health in education. The difficulty in many systems lies in the multiplicity of duties which results for the school physician in furnishing this information to all parties concerned.

Perhaps one of the greatest dangers besetting the school physician is the possibility of his becoming a pure routinist, because of the circumstances imposed upon him. The novelty of examining hundreds of well children soon wears off; and, unless he keeps careful scientific records, his work becomes mere drudgery and his objective approach to school health problems becomes obscured.

Anyone proposing to inquire into this problem of school health records will be amazed at the host of methods in current use. The textbooks of Wood and Rowell, Gulick and Ayres, Newmayer, Cornell, and others dealing with school-health methods offer the student of this subject invaluable help. A search of current literature, on the contrary, reveals a dearth of material. Perhaps this is as it should be. It portrays a picture of conservatism, yet it is open to criticism on the grounds that it prevents adequate discussion and perhaps improvement as a result of such discussion.

A committee (1) of the American Public Health Association has set forth its ideas in the form of a card which was suggested for experimental use in 1928, but to the writer's knowledge no further studies have been carried out to ascertain effectiveness of this record form. The forms and methods advocated by the American Child Health Association, the National Organization of Public Health Nursing, the American Medical Association, State departments of health, and various individual school physicians have their respective merits. But do they satisfy both educational and medical needs? The same question might be raised in regard to the many valuable contributions of leading school-health services.

It is not the writer's purpose to offer criticism of particular record systems, nor to extol others, nor even to hint at a solution of the problems raised. Admittedly these are problems for individuals of wide experience in school health work. They call for the combined judgment of school physicians, teachers, and perhaps individuals having practical knowledge of the business side of record systems. For the past 3 years it has been the writer's privilege to be a member of a school health committee of the Ann Arbor public schools whose task it was to evolve a health program which conformed to the newer philosophy of health education (2). The system which was being changed had stood the test of 29 years. It apparently fitted in well with the older methods, but failed miserably in the newer conceptions of education.

The work of this committee, consisting of school administrators, teachers, nurse, and physician, presented a combined lay and medical approach to the problem. The results of this cooperative thinking must therefore be looked upon accordingly. Compromises by teacher and physician became inevitable. As would be expected, newer objectives in education were looked upon rather hesitatingly by the educators when considered from the standpoint of practical application.

Briefly, the work of this committee resulted in the formulation of general purposes of basic school health activities and methods of procedure. These are set forth below:

I. Cumulative Health Record:

Purpose:

1. To encourage and educate parents, teachers, and pupils in positive methods of health promotion.
2. To provide a means for guiding and directing the child's growth and development from kindergarten through high school.

Method:

1. The record form, consisting of health history and examination blanks, is supplied the parents prior to the entrance of their child into school, with instructions to have the child examined by the family physician. Those unable to have this done are taken care of at school. All new pupils are given like instructions.

I. Cumulative Health Records—Continued.

Method—Continued.

2. Parents are invited to school examinations in the kindergarten, fourth, and seventh grades. Histories are kept up to date by nurse-parent conferences or by pupil conferences.
3. Public relations are fostered by including a prefatory note on each health record explaining the purpose of school health records, services offered by school health personnel, and the desirability of periodic health examinations.

II. Health Record to Teacher:

Purpose:

1. To convey to the teacher the results of the examination in such terms as to be useful to her in guiding the physical and mental growth of her pupils.

Method:

1. A single record made out in triplicate in lay language by the school physician on the day of examination. Immediately following the examination, these are placed in the hands of the classroom teacher, physical education teacher, and nurse, respectively, thus permitting conferences on the same day.

III. Teacher Guidance Chart:

Purpose:

1. To stimulate the teacher to take an active interest in the health of pupils in her classroom.
2. To encourage the teacher to look for deviations from the normal and bring them to the attention of the school physician.

Method:

1. A checking list group summary form which is filled out by the teacher with the data supplied her from the Health Record to Teacher and with data accumulated from personal observance of pupils.
2. Space is provided for checking defects corrected. Teacher and nurse are thus brought into close relationship, since both are interested in securing early corrections.

IV. Medical Record:

Purpose:

1. To provide a concise record of deviations from the normal for statistical purposes.

Method:

1. A single record made out in duplicate at the time of examinations, one copy remaining in the pupil's record and the other kept at the central office.
2. Defects are recorded in brief medical terminology.

V. Letter to Parents:

Purpose:

1. To convey to the parent the results of the school health examination.
2. To provide a means for interesting the parent in school health problems.

Method:

1. A brief typewritten letter containing a statement of findings, recommendations, suggestions as regards immunization, and a paragraph devoted to the policy of the school in regard to health service and education.

V. Letter to Parents—Continued.

Method—Continued.

2. Additional mimeographed literature is enclosed to aid the parent in understanding the nature of the defect discovered and particularly what is to be done. No mention is made of medical or surgical treatment.

VI. Follow-up Record:

Purpose:

1. To stimulate the school nurse to secure corrections, if possible, and assist those parents in need of help.

Method:

1. A single sheet containing a list of children having defects of 3 or 3+ severity, with space for recording results of follow-up.

(To be filled out by parent, returned to school health authorities and held as confidential.)

School Central High

Ann Arbor Public Schools
Division of School Health

Pupil's No 6679

October 18 1934

In the matter of school health the school authorities feel sure that parents readily see the need of an exchange of information between the school and the home. Accurate diagnosis of a child's health without knowledge of his previous health history is practically impossible for a physician. With the cooperation of the parent, all efforts on the part of the school health service immediately become more efficient from the standpoint of both the school and the home. This record merely covers the most essential facts needed by the school physician and these facts can only be supplied by the parent.

Individual Health Facts About Kenneth Blank (Pupil's Name)
Street E. Jefferson Number 415 Phone No. 6025
Age: Yrs. 18 Mos. 1 Sex male Date of Birth Sept. 29, 1916 Grade 11A
Nationality English Health: good X fair ... poor ... Family Physician J. A. Jones
No. of children in family 3 Brothers ... Sisters 2 ... Was child first born in family or second? first
Father's Name John Blank Age 45
If dead, age of death ... Cause ...
Father's birthplace Bad Axe, Michigan
Health: Good X Fair ... Poor ... Nationality English
Mother's Name Elizabeth Blank Age: 43 If dead, age at death ... Cause ...
Mother's Birthplace Detroit, Michigan
Health: Good X Fair ... Poor ... Nationality German-English
Guardian's Name ... Age: ...
Relation to pupil ... Number of Brothers and Sisters Dead none

INFORMATION REGARDING BIRTH AND INFANCY

Born at full term yes premature ... labor ... Instruments used ...
Weight at birth 7 lbs Breast fed yes Number of Months 10 months
Mixed feeding ... Artificial (kind) ... Convulsions none Hemorrhages none
First tooth at 5 mos. Walked at 14 mos. Talked at 12 mos. First sat erect 6 mos.

DISEASES OF BIRTH, INFANCY AND YOUTH

Check (√) disease and give age at which it occurred.

	(√)	Age		(√)	Age		(√)	Age
Measles	☑	6	Diphtheria	☐		Infantile paralysis	☐	
Croup	☐		Scarlet fever	☐		Epilepsy (convulsions)	☐	
Dysentery	☐		Smallpox	☐		Heart Disease	☐	
Typhoid	☐		Whooping cough	☑	5	Bone or joint disease	☐	
Mumps	☑	8	Pneumonia	☐		Kidney Disease	☐	
Influenza	☐		Chickenpox	☐		Enlarged glands	☐	
Pleurisy	☐		German measles	☐		Skin disease	☐	
Goiter	☐		Hay fever	☐		Rheumatism	☐	
Eczema	☐		Bronchitis	☐		Chorea (St. Vitus)	☐	
Tonsillitis	☑	9	Appendicitis	☐		Otitis (earache)	☑	2-3

Form A-102

Form I.—Cumulative Health Record (p. 1).

PHYSICAL COMPLAINTS

(Indicate with check mark (√) if complaint is or has been a factor causing disturbance of health. Next indicate in column adjacent the age when complaint was first noticed. If no longer noticed by pupil indicate with small letter *d* after age).

Growing pains	☑	14	Shortness of breath	☐	
Indigestion	☐		Nose bleeds (frequent)	☐	
Constipation	☐		Hard of hearing	☐	
Poor appetite	☐		Blurred vision	☑	16
Headaches	☑	12 d	Aching eyes	☑	16
Abdominal pain	☐		Repeated styes	☐	
Palpitation (fast heart)	☐		Skin eruptions	☐	
Frequent urination (day)	☐		Convulsions	☐	
Frequent urination (night)	☐		Backache	☐	
Weakness	☐		Persistent pain (anywhere)	☐	
Nausea	☐		Limp (gait)	☐	
Fainting spells	☐		Hernia	☐	
Ringing ears	☐		Vomiting spells	☐	
Frequent colds	☑	10 d	Dizziness	☐	
Persistent cough	☐		Speech difficulty	☐	

PHYSICAL BEHAVIOR

(Indicate with check mark (√) if present or has been noticed in the past. In line adjacent indicate approximate age when the particular form of behavior was first noticed. If habit has disappeared indicate with small letter *d*).

Thumb sucking	☑	1 d	Tires easily	☐	
Bed wetting	☐		Nail-biting	☐	
Tics (Muscle jerking)	☐		Nose-picking	☐	
Masturbation	☐		Sleep-walking	☐	
Under active	☐		Odd gait	☐	
Speech difficulty	☐		Mouth breather	☐	
Odd posture	☐		Snores	☐	
Overactive	☐		Left handed	☐	

MENTAL BEHAVIOR

(Indicate with check mark (√) in respective columns headed by a yes (Y) or no (N) if condition is or is not a factor in pupil's mental behavior. If condition is very pronounced indicate with a check mark in column headed by the letter (V). If condition has disappeared indicate with a small letter *d* in column (V).

	Y	N	V		Y	N	V		Y	N	V
Cheerful	☑	☐	☐	Temper outbursts	☑	☐	d	Night terrors	☐	☑	☐
Worries	☐	☑	☐	Well behaved	☑	☐	☐	Accepts authority	☑	☐	☐
Timid	☐	☑	☐	Moody	☐	☑	☐	Stubborn	☐	☑	☐
Trustful	☑	☐	☐	Defiance to discipline	☐	☑	☐	Emotionally calm	☑	☐	☐
Truant	☐	☑	☐	Unpopular with children	☐	☑	☐	Self conscious	☐	☑	☐
Ambitious	☑	☐	☐	Slovenly	☐	☑	☐	Phobias	☐	☐	☐
Nervous	☐	☑	☐	Persistent	☑	☐	☐	Day dreams	☑	☐	☐
Selfish	☐	☑	☐	Suspicious	☐	☑	☐	Shy	☐	☑	☐
Fearsome	☐	☑	☐	Easily discouraged	☐	☑	☐	Suggestible	☑	☐	☐
Bashful	☐	☑	☐	Likes friends	☑	☐	☑	Dreamer	☐	☑	☐
	☐	☐	☐		☐	☐	☐		☐	☐	☐

Form A-102

HEALTH INFORMATION REGARDING MEMBERS OF FAMILY

(Check the following diseases which have occurred among pupil's relatives: GM-grandmother; GF-grandfather; M-mother; F-father; S-sister; B-brother; A-aunt; U-uncle. In case of death give age of relative at death.

Disease	GM	GF	M	F	S	B	A	U	Disease	GM	GF	M	F	S	B	A	U
Alcoholism									Heart disease							✓	
Apoplexy									Kidney (Bright's)								
Asthma									Nervous Breakdown								
Hay fever		✓			✓				Rheumatism								
Cancer									Tendency to bleed								
Diabetes									Tuberculosis								
Epilepsy									Anemia								
Goiter									High blood pressure	✓							
Mental Disease									Eczema								

CONTAGIOUS DISEASE PROTECTION RECORD

(Indicate with a check mark (✓) if pupil has been protected against the following preventable diseases and year when protection was last received).

Smallpox vaccination (successful)........................☑; (unsuccessful)........................☐

Diphtheria (two injections) .... ☑; Schick test after injections—positive (unprotected)............☐

negative (protected)............☑

Typhoid (three injections)........................☐; Scarlet fever (five injections)........................☐

Dick test—positive (unprotected)........................☐; negative (protected)........................☐

SPECIAL DISEASE HISTORY

Has the pupil or anyone in the immediate family come in contact with anyone known to have tuberculosis? no

Has the pupil been tested for the presence of tuberculosis by the use of the tuberculin test? yes When 1928

X-ray of Chest?............ When............

OPERATIONS FOR

		Date			Date
Tonsils —	☑	1925		☐	19....
Adenoids —	☑	1925		☐	19....
Appendix —	☐	19....		☐	19....
Circumcision —	☑	1916		☐	19....

INJURIES

(Indicate cause, nature of, and age when received)

1. Broken arm — fell from limb of apple tree — 8 yrs old
2. ....
3. ....
4. ....

Form A-103

Form I (p. 3).

MENSTRUAL HISTORY (Girls Over 10 Years)

Menstruation began at..............................yrs. Regular.............................. Irregular..............................

It occurs every..............................days; It lasts.............................. days ....

Discharge between periods (Leucorrhea) ....

SPECIAL REQUEST OF PARENT OR GUARDIAN

The program of the division of school health is organized for the health promotion of the student body. It has for its primary purpose the furtherance of physical, mental and social health education. In order to carry out these aims there have been provided such services at (1) health examination of children in certain specified grades (2) nurse inspection of intervening grades (3) special examination of pupils competing in athletics, special examination of pupils at request of parents or teachers, special examinations during epidemic of contagious diseases (4) provision for parent-teacher consultation with school physician (5) home visitation by school health nurses.

Please indicate below any special examination desired concerning pupil, also any health problems which the physician may aid in solving.

Examination of eyes – they seem to bother him at times.

ANNUAL HEALTH EXAMINATION

It is the desire of the school health authorities that whenever possible parents provide for annual health examinations by the family physician and that these records be filed with the child's health record by the school health authorities. Blanks will be provided on request.

It is generally agreed by those people most concerned with health problems that the annual health examination is desirable for all people. The information revealed by the examination makes it possible to take simple, effective, and inexpensive preventive measures. Many diseases in their early stages give no warning by sickness or pain. However, the examination can reveal early signs of danger. Will parents adopting a policy of annual examination please check below?

Mrs. John Blauk
(Parent's Signature)

Form A-102.

(To be filled out by physician or nurse)

ANN ARBOR PUBLIC SCHOOLS
DIVISION OF SCHOOL HEALTH

Pupil's No. 6679

Pupil's Name Kenneth Blauk Address 415 E Jefferson St Ward 2nd

9-29-16

Phone 6025 Grade 11 A

Health Rating (') (') (') (') (') Intelligence Rating Social Rating

	MD	C	RN	MD	C	RN	MD	C	RN	MD	C	RN	MD		Special Examinations first aid, immunizations etc.
Date	10/18/34	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	Date	
1 Height (inches)	69														
2 Weight (pounds)	134														
3 % over (+)															
under (—)															
4 Vision L	20/		20/	20/		20/	20/		20/	20/		20/	20/		
(lens) R	20/		20/	20/		20/	20/		20/	20/		20/	20/		
(no L	20/[illegible] -3X		20/	20/		20/	20/		20/	20/		20/	20/		
lens) R	20/[illegible] 5X		20/	20/		20/	20/		20/	20/		20/	20/		
5 -color															
6 Audition L															
R															
7 Posture															
8 Nutrition															
9 Skin															
10 Scalp															
11 Eye															
12 Outer ear															
13 Nose	3X														
14 Mouth															
15 Teeth															
16 Gums															
17 Tongue															
18 Tonsils															
19 Pharynx															
20 Thyroid															
21 Glands															
a. Cervical															
b Axillary															
c. Inguinal															
22 Thorax															
23 Lungs															
24 Heart															
a. size															
b. rate															
c sounds															
d rhythm															
25 Abdomen															
a muscle tone															
b organs															
c intestine															
d tenderness															
26 Arms															
27 Legs															
28 Genitalia															
29 Feet L															
R															
30 Hygiene															
a physical															
b mental															
31 H habits															
32 H attitude															
33 H knowledge															
34 Bl pressure	134/80														
35 Const. type															
SPECIAL															
36 Larynx															
37 Pharynx															
38 Fundus															
39 Nares															
40 Ear drum															
41 Reflexes															
42 Disease protection															
a Diphth., a															
b Smallpox															
c Scarlet fever															
d Tuberculosis															
TOTAL															

M D —Health Examination by physician
R.N —Health Inspection by nurse
C —Correction obtained
Parent Present ( ), ( ), ( ), ( ), ( ).

	Physician	Date
1	S S K	10-18-34
2		
3		
4		

Form A 100

Form I (b).

EL 12-5M-9-34

ANN ARBOR PUBLIC SCHOOLS
DEPARTMENT OF SCHOOL HEALTH

Report to Teachers

Pupil *Kenneth Blank* Date of Examination *10-18-34*

No. *6679* School *Central High* Teacher *Smith*

Checking List*	P	N	?		P	N	?
Vision	✓			Audition		✓	
Nutrition		✓		Heart		✓	
Teeth		✓		Hygiene		✓	
Tonsils		✓		Tuberculosis Contact		✓	

Advice concerning
1. Activity:
   unrestricted ✓
   moderate
   very restricted
2. Rest *no*

Was parent present? *No*

Explanation and treatment suggestions to teachers:

1. Marked visual deficiency in both eyes.
2. Deformity of cartilage within the nose

†Advice given to parent:

Same

E.K.
School Physician

`Teacher plan of guidance

* EXPLANATION
P—POSITIVE
N—NEGATIVE
?—QUESTIONABLE

Form II.—Health Record to Teacher.

(For Explanation and Instructions for using see reverse side)

ANN ARBOR PUBLIC SCHOOLS

Health Guidance

Group Summary Form

TEACHER Miss Smith GRADE 11A SCHOOL YEAR 1934 SEMESTER 1st

Name of Pupil	Vision	Audition	Nutrition	Teeth	Tonsils	Heart	Physical Hygiene	Tuberculosis Contact	Speech	Feet	Posture	Nose							Immunization: Smallpox	Immunization: Diptheria	Immunization: Scarlet Fever	Rechecked by clinic	Remarks
	T P C	T P C	T P C	T P C	T P C	T P C	T P C	T P C	T P C	T P C	T P C	T P C	T P C	T P C	T P C	T P C	T P C	T P C					
Kenneth Black	✓ ✓											✓											will have operation on nose during Christmas vacation

Form III.—Teacher Health Guidance Chart.

INSTRUCTIONS FOR USING THIS FORM

Spaces marked "T" are to be checked by teacher as soon as a defect is discovered or whenever the teacher becomes concious that some health problem exists.

Spaces marked "P" are to be checked after the teacher has referred the case to the school physician and an examination has been made.

Spaces marked "C" are to be marked when a defect has been corrected or when treatment has begun.

Spaces marked "Recheck" are to be used whenever the school physician advises a periodic check up. A figure should be placed in the space to indicate frequency interval.

Blank spaces are to be used for defects not included in the list.

Spaces marked "remarks" are to be used by the teacher or physician for any significant reminders, or for any special program adjustments which are being made for the particular child.

(Reverse of Form III).

Pupil *Kenneth Black* Date *10-18-34*

No. *6679*

Ann Arbor Public Schools
DEPARTMENT OF SCHOOL HEALTH
Medical Records

1. V.A. 20/40 (L+R)
2. Dev. nasal septum

Form 4-65

School Physician

Form IV.—Medical Record.

ANN ARBOR PUBLIC SCHOOLS
OTTO W. HAISLEY, SUPERINTENDENT
ANN ARBOR, MICHIGAN

EARL E. KLEINSCHMIDT, M. S., M. D.
MEDICAL DIRECTOR

October 19, 1934

Mr. John Blank
415 E. Jefferson St.
Ann Arbor, Michigan

Dear Mr. Blank:

This is to notify you of the results of the health examination given your son, Kenneth, at the high school recently.

The examination revealed him to be in apparent good health. There were several findings, however, of importance at this time. These deserve consideration inasmuch as they may affect his future health. These consist of the following:

1. Marked visual deficiency (both eyes)
2. Deviated nasal septum (deformity of the cartilage within the nose)

Our only suggestion as regards disease protection would be another tuberculin test, to detect the presence or absence of incipient tuberculosis.

School authorities are most desirous of keeping the student body in good health. This, of course, is possible only if home and school cooperate to the fullest degree in health matters. For this reason, we ask you to give this letter your careful consideration. Should there be any questions pertaining to the results of the examination, the school nurse will gladly call and explain them to you.

We trust that this report will be of value in informing you of your son's present condition.

Very sincerely,

Division of School Health
ANN ARBOR PUBLIC SCHOOLS

EEK:MH

School Physician

Form V (a).—Letter to Parents.

NOTE TO PARENTS

Height	
Weight	
% over	
% under	
Vision (lens)L	
R	
(no lens)L	
R	
Color vision	
Audition L	
R	
Posture	
Nutrition	
Skin	
Scalp	
Eye	
Outer ear	
Nose	
Mouth	
Teeth	
Gums	
Tongue	
Tonsils	
Pharynx	
Thyroid	
Glands	
Thorax	
Lungs	
Heart	
Abdomen	
Arms	
Legs	
Feet	
Mental hygiene	
Physical "	
Health habits	
" attitudes	
" knowledge	
Blood pressure	
Constit. type	
SPECIAL	
Larynx	
Fundus	
Nares	
Ear drum	
Reflexes	
Immuniz.(diph.)	
(smallpox)	
Tuberculin test	

The Health Examination is included in the school curriculum primarily to give the pupil an experience in health education. We are trying to build a better race of people. To do this it becomes necessary to prevent the occurrence of disease as far as possible by educating children in the essentials of healthy living. We believe that regular attention to their health needs is a desirable means of reaching this goal.

Our present set-up calls for an examination of children in the kindergarten, fourth, seventh, tenth, and twelfth grades by the school physician. Reports are sent following each examination in case you are unable to be present. Children in the intervening grades are inspected each year by the nursing staff.

Cumulative records of all findings and suggestions are kept for each pupil. We ask your cooperation in keeping them up to date. These are available at all times and may be taken to the family physician for periodic examinations. All health information is treated as confidential and records are kept in steel files. At the time of graduation from high school the complete record is presented to the graduate. When moving out of the city parents may have the records for transfer to the new school.

The content of the school health examination differs from that given by the family physician in that it does not include, for example, blood tests, urinalysis, X-Ray examination, a tuberculin test, or whatever specific laboratory test of organic function may be deemed necessary. The school health examination does, however, include a careful examination of the items listed in the chart at the left. The time allotment given each child is necessarily limited. Most difficult of all is the fact that these examinations must frequently be conducted without your presence. We therefore encourage you to attend whenever possible, inasmuch as a physician's judgment depends on accurate first-hand knowledge from the parent of the child's health habits as concerns eating, resting, his past diseases, and his complaints.

The accompanying letter is a statement of findings noted and suggestions made in our examination. For a complete health examination including the barious laboratory and clinical tests we suggest that you take your child each year to your family physician and dentist.

DIVISION OF SCHOOL HEALTH
Ann Arbor Public Schools

Form V (b).

Follow-up Record
(Defects of 3 or 3x Severity)

Name	Grade	Date Defect Discovered	Nature of Defect	Date of Correction	Remarks
Kenneth Black	11 A	10-18 34	1 V. A 20/40 (L+R) 2 Dev. nasal septum	10-24-34	Will have nose operated on during Christmas vacation

Form VI.—Follow-up Record.

School health records must serve useful ends. They must be purposive, educational, scientific, and practical. It is difficult to state which characteristic should be the most important. If they accomplish the purpose set up for them, it would appear that their value and use were justified.

The record system of the Ann Arbor public schools has served to advantage in bringing the teacher, nurse, and physician into a working relationship. As was revealed in the recent study (3) of the medical examination program of New York City, "success in the correction of defects does not depend upon the doctor or the nurse or the teacher alone. It is distinctly a cooperative job." Our program, we feel, has that characteristic.

In such a brief presentation it has been impossible to discuss adequately the records referred to. It is hoped, however, that enough material has been given the reader to make clear the problem and the method we have used to integrate the work of the health service with the entire school program.

REFERENCES

(1) Report of Subcommittee on Record Forms—Tentative record forms for school health work. School Health Record Form 2. American Journal of Public Health, May 1929, Vol. XIX, No. 5, pp. 527–534.
(2) Haisley, Otto W.: Adjusting health education to the newer trends in educational philosophy. Health and Public Education, October 1932, Vol. III, No. 8, pp. 14–17.
(3) Physical defects—The pathway to correction. Published by the American Child Health Association. October 1934.

STATE AND INSULAR HEALTH AUTHORITIES, 1934

DIRECTORY, WITH DATA AS TO APPROPRIATIONS AND PUBLICATIONS

Directories of the State and insular health authorities of the United States for each year from 1912 to 1933, except 1932, have been published in the PUBLIC HEALTH REPORTS and reprinted as separates [1] for the information of health officers and others interested in public-health activities. The present directory (1934), like those previously issued, has been compiled from information furnished by the respective State and insular health officers, and includes data as to appropriations and publications.

Where an officer has been reported to be a "whole-time" health officer, that fact is indicated by an asterisk (*). For this purpose a "whole-time" health officer is defined as "one who does not engage in the practice of medicine or in any other business, but devotes all of his time to official duties."

ALABAMA DEPARTMENT OF PUBLIC HEALTH

Board of censors of the medical association of the State of Alabama, acting as a State committee of public health:
- B. M. Miller, governor, ex-officio chairman, Montgomery.
- E. V. Caldwell, M. D., chairman, Huntsville.
- J. D. Perdue, M. D., Mobile.
- Fred W. Wilkerson, M. D., Montgomery.
- D. T. McCall, M. D., Mobile.
- M. S. Davie, M. D., Dothan.
- J. S. McLester, M. D., Birmingham.
- Lloyd Noland, M. D., Fairfield.
- George H. Searcy, M. D., Tuscaloosa.
- S. A. Gordon, M. D., Marion.
- C. A. Thigpen, M. D., Montgomery.

Executive health officer:
- *J. N. Baker, M. D., State health officer, Montgomery.

Administrative assistant:
- *D. L. Cannon, M. D., Montgomery.
- *B. F. Austin, M. D., field adviser in county organization, Montgomery.
- *Bessie A. Tucker, secretary to State health officer, Montgomery.

Financial secretary:
- *G. S. Savage, Montgomery.

Registrar of vital statistics:
- *Ethel Hawley, acting director, Montgomery.

Laboratories of the State board of health:
- General director:
  - *James G. McAlpine, Ph. D., Montgomery.
- Anniston branch:
  - *Mary Walker, Anniston.
- Birmingham branch:
  - *George A. Denison, M. D., Birmingham.
- Mobile branch:
  - *C. H. Waite, Mobile.
- Tennessee Valley:
  - *C. C. Johnson, Decatur.
- Tuscaloosa branch:
  - *Cannie Campbell, Tuscaloosa.
- Selma branch:
  - *Cooper Brougher, Selma.
- Dothan branch:
  - *Nellie K. Whitfield, Dothan.
- Huntsville branch:
  - *Mrs. Buford Gatlin, Huntsville.

Sanitation:
- Director:
  - *G. H. Hazlehurst, C. E., M. C. E., Montgomery.
- Assistant engineers:
  - *H. G. Menke, B. C. E., Montgomery.
  - *C. C. Kiker, B. C. E., Montgomery.
  - *T. H. Milford, Montgomery.
- Division of inspection:
  - *C. A. Abele, Ch. E., director, Montgomery.
  - *H. J. Thrasher, assistant director, Huntsville.
  - *F. D. Downs, dairy inspector, Montgomery.

Communicable disease control:
- *D. G. Gill, M. D., D. P. H., director, Montgomery.
- *Walton H. Y. Smith, M. D., C. P. H., assistant director, Montgomery.
- *R. A. Brown, M. D., Montgomery.
- *Myrtle Martin, R. N., Montgomery.

Division of public health nursing:
- *Frances C. Montgomery, R. N., director, Montgomery.
- *Margaret Murphy, R. N., Montgomery.
- *Catherine Corley, R. N., Montgomery.

Appropriation for fiscal year ending September 30, 1933:
- Annual appropriation for all health work, including county organization, $400,000. (Subject to proration on basis of available revenue coming into the general fund. This makes amount indeterminate.)

ALASKA DEPARTMENT OF HEALTH

Executive health officer:
- Walter W. Council, M. D., commissioner of health, Juneau.

Assistant commissioners of health:
- A. D. Haverstock, M. D., Seward.
- Rex F. Swartz, M. D., Nome.
- Floyd B. Gillespie, M. D., Fairbanks.

Appropriation for 1933-35, $13,800.

ARIZONA STATE BOARD OF HEALTH

State board of health:
- B. B. Moeur, Governor, president, Phoenix.
- A. T. La Prade, vice president, Phoenix.
- George C. Truman, superintendent, secretary, Phoenix.

[1] Reprints Nos. 83, 123, 190, 286, 344, 405, 488, 544, 605, 706, 775, 871, 949, 1043, 1106, 1188, 1254, 1334, 1425, 1522, and 1604, from the PUBLIC HEALTH REPORTS.

State board of health—Continued.
F. E. Doucette, executive secretary, Phoenix.
Fred Ruppelius, statistician, Phoenix.
Ralph Thomas, assistant secretary and auditor, Phoenix.
Executive health officer:
George C. Truman, M. D., State superintendent of health, Phoenix.
State laboratory:
Jane Rider, director, Tucson.
Marion Stroud, bacteriologist, Phoenix.
W. B. West, assistant bacteriologist, Tucson.
Fred Baker, assistant bacteriologist, Phoenix.
Epidemiologist:
*H. F. Stanton, M. D.
Sanitary engineer:
*F. C. Roberts.
County health units:
*A. N. Crain, M. D., medical director, Maricopa County, Phoenix.
*R. B. Durfee, M. D., medical director, Cochise County, Bisbee.
*Geoffrey Morris, M. D., medical director, Pima County, Tucson.
*Anson B. Ingels, M. D., medical director, Gila County, Globe.
Appropriations, year ending June 30, 1935:

Board of health	$15,755
Child hygiene	18,890
State laboratory	9,061

ARKANSAS STATE BOARD OF HEALTH

Board of health:
J. G. Gladden, M. D., president, Western Grove.
E. D. McKnight, M. D., Brinkley.
W. F. Smith, M. D., Little Rock.
Thomas Wilson, M. D., Wynne.
L. D. Duncan, M. D., Waldron.
W. H. Hodges, M. D., Malvern.
F. O. Mahony, M. D., El Dorado.
Executive health officer:
***Wm. B. Grayson, M. D.**, State health officer, Little Rock.
Bureau of vital statistics:
*Mrs. J. B. Collie, statistician, Little Rock.
Hygienic laboratory:
*H. V. Stewart, associate director, Little Rock.
Bureau of sanitation and malaria control:
*M. Z. Bair, B. Sc. E., chief sanitary engineer, Little Rock.
Bureau of child hygiene:
———
County health units:
*Gordon Hastings, M. D., director, Little Rock.
Appropriations for biennial period ending June 30, 1935:

Executive department, salaries and miscellaneous	$23,000
Bureau of vital statistics	28,000
Bureau of sanitation	2,500
Hygienic laboratory	14,840
County health units and rural sanitation	160,000

CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

Board of public health:
Howard Morrow, M. D., president, San Francisco.
Edward M. Pallette, M. D., vice president, Los Angeles.
J. D. Dunshee, M. D., director of public health, Sacramento.
Gifford L. Sobey, M. D., Paso Robles.
William R. P. Clark, M. D., San Francisco.
George H. Kress, M. D., Los Angeles.
Junius B. Harris, M. D., Sacramento.
Department of public health:
***J. D. Dunshee, M. D.**, director of public health, Sacramento.
District health officer:
*Gavin Telfer, M. D., southern division.
Bureau of epidemiology:
*Harlan F. Wynns, M. D., chief, San Francisco.
*Ida May Stevens, supervising morbidity statistician.
Bureau of sanitary inspections:
*Edward T. Ross, chief, Sacramento.
Bureau of vital statistics:
*Mrs. Marie B. Stringer, registrar, Sacramento.
Bureau of registration nurses:
*Helen F. Hansen, chief, Sacramento.
Bureau of tuberculosis:
*Edyth L. M. Tate-Thompson, chief, Sacramento.
Bureau of food and drug inspections:
*M. P. Duffy, chief.
Bureau of laboratories:
*W. H. Kellogg, M. D., chief, Berkeley.
Bureau of sanitary engineering:
*C. G. Gillespie, C. E., chief, Berkeley.
Bureau of child hygiene:
*Ellen S. Stadtmuller, M. D., chief, San Francisco.
Appropriations, available July 1, 1933, for biennial period ending June 30, 1935 (85th and 86th years):

Administration:	
For support, department of public health	$401,612
Bureau of cannery inspection:	
For support (payable from cannery-inspection funds)	133,920
Bureau of registration of nurses:	
For support (payable from nurses registration funds)	38,760
Tuberculosis bureau:	
Allotment for support, included in item "for support, department of public health", $18,040.	
For subsidies	975,000
Total	1,549,292

Other sources of revenue:
Fees for registration of nurses, $10 each. (Fees for California graduate nurses, $5 only.)
Renewal of registration certificates, $1 each per year.
Licensing of cold-storage warehouses, rated according to capacity, for credit to general fund.
Fines for violation of pure food and drugs act, for credit to general fund.
Fees for licenses, $50 each, and contributions, for credit to bureau of cannery inspection.
Fees for searches and certified copies of records, for credit to general fund.
Fees for inspection and registration of aviaries, $5 each.
Fees for inspection of clinics and dispensaries, $5 each.
Publications issued by health department:
Biennial report.
Weekly bulletin.

COLORADO DIVISION OF PUBLIC HEALTH

State board of health:
Paul J. Connor, M. D., president, Denver.
William P. Gasser, M. D., vice president, Loveland.
S. R. McKelvey, M. D., secretary, Denver.
G. W. Bumpus, D. O., Denver.
Ura O. Musick, Colorado Springs.
N. M. Burnett, M. D., Lamar.
Ben Beshoar, M. D., Trinidad.
C. A. Davlin, M. D., Alamosa.
Harvey W. Snyder, M. D., Denver.
Division of administration:
***S. R. McKelvey, M. D.**, secretary and executive officer, Denver.
Division of epidemiology:
*S. R. McKelvey, M. D., acting epidemiologist.
Division of social hygiene:
*S. R. McKelvey, director.
Division of plumbing:
*Irving A. Fuller, chief inspector.
Division of bacteriology:
*W. C. Mitchell, M. D., bacteriologist.
Division of sanitary engineering:
*Benjamin V. Howe, sanitary engineer.
Division of vital statistics:
*S. R. McKelvey, M. D., State registrar.
Division of food and drugs:
*S. R. McKelvey, M. D., acting commissioner.

Appropriations for fiscal years ending June 30, 1934 and 1935:

	1934	1935
Salaries	$29,530	$29,650
Laboratory equipment and supplies	1,250	1,250
Printing	2,000	2,000
Traveling expenses	3,700	3,700
Venereal disease (no appropriation)	-------	-------
Incidental expenses	900	900
Total	37,380	37,500

CONNECTICUT DEPARTMENT OF HEALTH

Public health council:
C.-E. A. Winslow, D. P. H.
James W. Knox.
James A. Newlands.
David R. Lyman, M. D.
Robert A. Cairns, C. E.
Joseph M. Ganey, M. D.
Executive health officer:
*Stanley H. Osborn, M. D., C. P. H., commissioner of health, Hartford.
Bureau of preventable diseases:
*Millard Knowlton, M. D., C. P. H., director.
Bureau of vital statistics:
*William C. Welling, director.
Bureau of public-health nursing:
*Elizabeth S. Taylor, R. N., director.
Bureau of child hygiene:
*A. Elizabeth Ingraham, M. D.
Bureau of public-health instruction:
*Elizabeth C. Nickerson, C. P. H.
Bureau of laboratories:
*F. Lee Mickle, director.
Bureau of sanitary engineering:
*Warrent J. Scott, director.
Bureau of occupational diseases:
*Albert S. Gray, M. D., director.
Bureau of venereal diseases:
*Henry P. Talbot, M. D., director.
Bureau of mental hygiene:
*C. B. Horton, M. D., director.
Division of mouth hygiene:
Clyde R. Salmons, D. D. S., chief.
Division of medical registration:
*Ruth H. Monroe, chief.
Appropriation for fiscal period ending June 30, 1935 (2 years), $569,654.
Publications issued by health department:
Weekly bulletin.
Monthly bulletin.
Annual vital-statistics report.
Annual report of State department of health.
Miscellaneous pamphlets.

DELAWARE STATE BOARD OF HEALTH

State board of health:
William P. Orr, M. D., president, Lewes.
Mrs. Charles Warner, vice president, Wilmington.
Robert E. Ellegood, M. D., Wilmington.
Margaret I. Handy, M. D., Wilmington.
Mrs. F. G. Tallman, Wilmington.
Stanley Worden, M. D., secretary, Dover.
Mrs. Arthur Brewington, Delmar.
Charles R. Jefferis, Jr., D. D. S., Wilmington.
Executive health officer:
*Arthur C. Jost, M. D., C. M., Dover.
Director of laboratory:
*Rowland D. Herdman, Dover.
Director of child hygiene:
*Clealand A. Sargent, M. D., C. P. H., Dover.
Sanitary engineer:
*Richard C. Beckett, Dover.
Superintendent of Brandywine Sanatorium:
*Lawrence D. Phillips, M. D., Marshallton.
Superintendent of Edgewood Sanatorium:
*Elizabeth Van Vranken, R. N., Marshallton.
State oral hygienist:
Miss M. E. Wagner, R. D. H.
County unit officers:
*J. R. Downs, M. D., New Castle County.
*E. F. Smith, M. D., Kent County.
*J. B. Derrickson, M. D., Sussex County.
Appropriations for each fiscal year ending June 30, 1934 and 1935:

General administration	$81,000
Hygienic laboratory	10,000
Edgewood Sanatorium for colored tuberculous patients	27,000
Brandywine Sanatorium for white tuberculous patients	120,000
Dental hygiene	12,000
Total	250,000

Publications:
Annual report.
Bulletins on health subjects.
Weekly circular.

DISTRICT OF COLUMBIA HEALTH DEPARTMENT

Executive health officer:
*George C. Ruhland, M. D., health officer, Washington.
Assistant health officer:
*Edward J. Schwartz, M. D., Washington.
Chief clerk and deputy health officer:
*Arthur G. Cole, Washington.
Chief, Bureau of Preventable Diseases, and director, bacteriological laboratory:
*James G. Cumming, M. D., Washington.
Bacteriologist:
*John E. Noble, Washington.
Serologist:
*Jesse P. Porch, D. V. M., Washington.
Chemist:
*John B. Reed, Washington.
Chief sanitary inspector:
*J. Frank Butts, Washington.
Director child-hygiene service:
*Hugh J. Davis, M. D., Washington.
Chief food inspector:
*Reid R. Ashworth, D. V. S., Washington.
Chief medical and sanitary inspector of schools:
*Joseph A. Murphy, M. D., Washington.
Appropriations for the fiscal year ending June 30, 1935:

Salaries	$160,650
Prevention of communicable diseases	27,783
Isolation wards at hospitals	25,000
Milk and food inspection and regulation	6,000
Dispensary service, including treatment of tuberculosis and venereal diseases	42,998
Maintaining a child-hygienic service	45,834
Hygiene and sanitation, public schools	84,554
Laboratory service	1,800
Miscellaneous	1,900
Total	396,519

Publications issued by Health Department:
Weekly report by Health Department.
Annual report of health officer.
Monthly statement of average grade of milk sold.

FLORIDA STATE BOARD OF HEALTH

Board of health:
N. A. Baltzell, M. D., president, Marianna.
R. L. Hughes, M. D., Bartow.
Harry Dash Johnson, M. D., Daytona Beach.
Executive health officer:
*Henry Hanson, M. D., State health officer, Jacksonville.
Diagnostic laboratories:
*Paul Eaton, M. D., D. P. H., director, Jacksonville.
Bureau of vital statistics:
*Stewart G. Thompson, D. P. H., director, Jacksonville.
Bureau of communicable diseases:
*F. A. Brink, M. D., director, Jacksonville.
Bureau of sanitary engineering:
*Louva G. Lenert, director, Jacksonville.

Division of public health nursing:
*Ruth E. Mettinger, R. N., director.
Appropriation for health department:
One-half mill tax levied upon the assessable property of the State for the year ending June 30, 1933, to be supplemented from the general fund: Appropriation, 1933-35, $179,600 annually.
Publications issued by health department:
Pamphlets covering all phases of public health.
Public health information disseminated through the weekly and daily papers of the State.
Florida health notes.
Annual reports.

GEORGIA DEPARTMENT OF PUBLIC HEALTH

State Board of Health:
Dr. Cleveland Thompson, Millen, First District.
Dr. O. K. Sharp, Arlington, Second District.
Mr. R. C. Ellis, Americus, Third District.
Dr. M. M. Head, Zebulon, Fourth District.
Mr. R. F. Maddox, Atlanta, Fifth District.
Dr. A. R. Rozar, Macon, Sixth District.
Dr. M. M. McCord, Rome, Seventh District.
Dr. H. W. Clements, Adel, Eighth District.
Dr. L. C. Allen, Hoschton, Ninth District.
Dr. W. A. Mulherin, Augusta, Tenth District.
Dr. T. C. Marshall, Atlanta, State at large.
Dr. Claude Rountree, Thomasville, State at large.
Dr. M. H. Varn, Atlanta, State at large.
Dr. R. F. Sullivan, Savannah, State at large.
Executive health officer:
*T. F. Abercrombie, M. D., director, Atlanta.
*J. P. Bowdoin, M. D., assistant director.
Division of venereal-disease control:
*Joe P. Bowdoin, M. D., chief, Atlanta.
Division of county health work:
*H. C. Schenck, M. D., chief, Atlanta.
Division of laboratories:
*T. F. Sellers, M. D., chief, Atlanta.
Division of sanitary engineering:
*L. M. Clarkson, chief, Atlanta.
Bureau of vital statistics:
*Butler Toombs, chief, Atlanta.
Division of child hygiene:
*Joe P. Bowdoin, M. D., chief, Atlanta.
Division of epidemiology:
*Daniel L. Seckinger, M. D., chief, Atlanta.
Division of accounting and purchasing:
*C. L. Tinsley, chief, Atlanta.
Appropriations for the fiscal years ending Dec. 31, 1934 and 1935:
General appropriation $125,000
Scaled proportionately to State income. Only 75 percent, or $93,750, will be paid on 1934 appropriation.

TERRITORY OF HAWAII BOARD OF HEALTH

Board of health:
F. E. Trotter, M. D., president and executive health officer, Honolulu.
W. B. Pittman, attorney general, Honolulu.
Guy C. Milnor, M. D., Honolulu.
Donald S. Bowman, Honolulu.
Alan S. Davis, Honolulu.
James A. Williams, Honolulu.
J. Platt Cooke, Honolulu.
Executive health officer:
*F. E. Trotter, M. D., president of the board of health, Honolulu.
Secretary:
*Mae R. Weir, Honolulu.
Bureau of sanitation and pure food:
*S. W. Tay, director, Honolulu.
*F. K. Schultz, division supervisor, Honolulu.
*Clifford H. Bowman, division supervisor, island of Hawaii, Hilo.
*R. C. Lane, division supervisor, island of Maui, Wailuku.
*A. P. Christian, division supervisor, island of Kauai, Lihue.
*Robert B. Pauole, sanitary inspector, Leeward Molokai, Kaunakakai.
Health officer, island of Hawaii:
*Joseph S. Caceres, Hilo.
Bureau of vital statistics:
*M. H. Lemon, registrar general, Honolulu.
Laboratory technician:
*Le Beryl Alexander, M. D., Honolulu.
Tuberculosis bureau:
*C. Alvin Dougan, M. D., director.
Bureau of public health nursing:
*Mabel L. Smyth, R. N., director, Honolulu.
Food commissioner and analyst:
*M. B. Bairos, Honolulu.
Territorial hospital:
*A. B. Kroll, superintendent, Kaneohe, Oahu.
*A. B. Eckerdt, M. D., medical director, Kaneohe, Oahu.
Bureau of communicable diseases:
Frederick K. Lam, M. D., director, Honolulu.
Health officer, island of Kauai:
A. M. Ecklund, M. D., Koloa.
Bureau of maternal and infant hygiene and child welfare:
Frederick K. Lam, M. D., director, Honolulu.
Bacteriologist, island of Hawaii:
*Fred S. Paine, Hilo.
Bacteriologist, island of Maui:
Haliburton McCoy, M. D., Puunene.
Bacteriologist, island of Kauai:
A. M. Ecklund, M. D., Koloa.
Appropriations, 1933-35:

Board of health—general administration:	
Personal services	$44,000.00
Other current expenses	7,000.00
Bureau of vital statistics:	
Personal services	20,000.00
Other current expenses	2,000.00
Tuberculosis—Government hospital (Puumaile Home):	
Personal services	47,017.50
Other current expenses	58,000.00
Equipment	481.10
Tuberculosis bureau:	
Personal services	14,040.00
Other current expenses	9,060.00
Equipment	900.00
Tuberculosis—private hospitals:	
Contributions to Leahi Home	144,000.00
Contributions to Kula Sanitarium	76,800.00
Contributions to Samuel Mahelona Memorial Hospital	55,500.00
Burea of public health nursing:	
Personal services	135,108.00
Other current expenses	10,000.00
Plague campaign:	
Personal services	36,648.00
Other current expenses	9,352.00
Bureau of communicable diseases:	
Personal services	20,000.00
Other current expenses	20,000.00
Bureau of maternal and infant hygiene:	
Personal services	6,400.00
Other current expenses	1,800.00
Boards of examiners:	
Personal services	216.00
Other current expenses	405.00
Sanitation and pure food:	
Personal services	91,898.00
Other current expenses	10,000.00
Equipment	230.00
Agents—Government physicians:	
Personal services	76,180.00
Territorial hospital:	
Personal services	320,784.00
Other current expenses	140,296.00
Equipment	500.00
Structures and improvements	2,000.00
Total	1,360,615.60

Publications issued by health department:
Annual report of president.
Registrar gener 's report.

IDAHO DEPARTMENT OF PUBLIC WELFARE

Department of public welfare:
- *Lewis Williams, commissioner.
- *W. V. Leonard, B. S M. E., State chemist and sanitary engineer.
- *Lawrence J. Peterson, bacteriologist.
- *A. W. Klotz, assistant chemist.
- *James M. Welsh, dairy food, drug, hotel, and sanitary inspector.
- *C. H. Watson, dairy, food, drug, hotel, and sanitary inspector.

Executive health officer:
- *Lewis Williams, commissioner of public welfare, Boise.

Bureau of child hygiene:
- *Mrs. Deborah H. Worthington, director, Boise.

Appropriations for biennial period ending Dec. 31, 1934:

Personal services	$35,205
Other expenses	12,605
Venereal-disease control	1,500
Vaccines and antitoxins	2,000
Child hygiene	2,860
Total	54,170

ILLINOIS DEPARTMENT OF PUBLIC HEALTH

Board of public-health advisers:
- Clifford U. Collins, M. D., chairman.
- Herman N. Bundesen, M. D.
- Walter W. Hamburger, M. D.
- Maurice Rubel, M. D.
- ———— ————.
- ———— ————.

Executive health officer:
- *Frank J. Jirka, M. D., director of public health, Springfield.

Assistant director of public health:
- *A. C. Baxter, M. D.

Division of sanitary engineering:
- *Harry F. Ferguson, C. E., chief sanitary engineer.

Division of communicable diseases:
- *J. J. McShane, M. D., D. P. H., chief.

Division of child hygiene and public-health nursing:
- *Grace S. Wightman, M. D., chief.

Division of tuberculosis:
- *A. C. Baxter, M. D., acting chief.

Division of laboratories:
- *Howard J. Shaughnessy, Ph. D., chief.

Division of vital statistics:
- *Sheldon L. Howard, registrar.

Division of public-health instruction:
- *Baxter K. Richardson, chief.

Division of hotel and lodging-house inspection:
- *William P. Haberkorn, superintendent.

Appropriations for biennial period ending June 30, 1935:

Salaries	$674,960
Salaries State officers	27,800
Office expenses	23,176
Traveling expenses	128,661
Operation	269,116
Repairs and equipment	17,875
Contingent	15,000
Printing	50,000
Postage	25,000
Sanitary water board law	20,000
Rabies	12,000
Emergency	25,000
Total	1,288,588

Publications issued by health department:
- Illinois Health Messenger (bimonthly).
- Weekly press bulletin.
- Educational health circulars.

INDIANA DEPARTMENT OF COMMERCE AND INDUSTRY, DIVISION OF PUBLIC HEALTH

Board of health:
- Edmund M. Van Buskirk, M. D., president, Fort Wayne.
- John Clay Glackman, M. D., Rockport.
- Ernest Rupel, M. D., Indianapolis.
- Verne K. Harvey, M. D., secretary, Indianapolis.

Executive health officer:
- *Verne K. Harvey, M. D., C. P. H., director, Indianapolis.

Collaborating epidemiologist and assistant director:
- Thurman B. Rice, M. D., Indianapolis.

Epidemiologist:
- *J. W. Jackson, M. D., Indianapolis.

Bureau of vital statistics:
- *H. M. Wright, statistician and registrar, director, Indianapolis.

Bacteriological laboratory:
- Clyde G. Culbertson, M. D., director, Indianapolis.

Division of chemistry:
- *Martin L. Lang, State food and drug commissioner, Indianapolis.

Bureau of dairy products:
- *John Taylor, director, Indianapolis.

Bureau of sanitary engineering:
- *Louis A. Geupel, B. S. C. E., director, Indianapolis.

Food and drug laboratory:
- *Frank J. Koehne, B. Ch. E., director, Indianapolis.

Bureau of health education:
- *Bynum Legg, director, Indianapolis.

Bureau of housing, industrial and school hygiene:
- *Fred K. Myles, director, Indianapolis.

Bureau of public-health nursing:
- *Eva F. McDougall, R. N., director, Indianapolis.

Appropriation for the fiscal year beginning July 1, 1934, and ending June 30, 1935, $207,300.

IOWA STATE DEPARTMENT OF HEALTH

EX OFFICIO

Clyde L. Herring, governor, Des Moines.
Mrs. Alex Miller, secretary of State, Des Moines.
Leo J. Wegman, treasurer of State, Des Moines.
Ray Murray, secretary of agriculture, Des Moines.
Walter L. Bierring, M. D., State commissioner of health, Des Moines.

APPOINTIVE BY GOVERNOR

C. A. Boice, M. D., president, Washington.
T. D. Kas, M. D., secretary, Sutherland.
J. F. Aldrich, M. D., Shenandoah.
C. W. Ellyson, M. D., Waterloo.
J. M. Smittle, M. D., Waucoma.

Executive health officer:
- *Walter L. Bierring, M. D., commissioner of health, Des Moines.
- *Frederick J. Swift, M. D., deputy commissioner, Des Moines.

Executive clerk:
- *Albert F. Vogt, Des Moines.

Division of child health and health education:
- *Joseph H. Kinnaman, M. D., Des Moines.

Division of communicable diseases and epidemiology:
- *Carl F. Jordan, M. D., C. P. H., Des Moines.

State hygienic laboratories:
- *M. E. Barnes, M. D., Dr. P. H., director, Iowa City.

Division of public-health nursing:
- *Edith S. Countryman, R. N., director, Des Moines.

Division of nursing education:
- *Maude E. Sutton, R. N., director, Des Moines.

Division of vital statistics:
- *Robert L. McLaren, director, Des Moines.

Division of licensure and registration:
- *H. W. Grefe, director, Des Moines.

Division of law enforcement:
- *Herman B. Carlson, attorney, Des Moines.

Division of public health engineering:
- *A. H. Wieters, director, Des Moines.

Division of barber inspection:
- *William B. Wilson, director, Des Moines.

Division of cosmetology inspection:
- *Hilda Geerdes, executive secretary, Des Moines.

Housing work is carried on by engineering division.
Medical, nurses, dental, optometry, cosmetology, chiropractic, osteopathy, embalming, podiatry, and barber examining boards are combined in the State department of health.

Appropriations for fiscal year ending June 30, 1935:

For salaries, support, maintenance, and miscellaneous purposes	$45,340
For child health and health education	6,600
For inspector salaries, support, maintenance and miscellaneous	4,200
For public health engineering salaries, support, maintenance, and miscellaneous	18,910
For barber inspection salaries, support, maintenance, and miscellaneous	15,150
For cosmetology inspection salaries, support, maintenance, and miscellaneous	11,360
For the following examining boards: Medical, nurses, dental, osteopathy, chiropractic, embalmers, optometry, podiatry	13,815
Total	115,375

Publications:
Biennial report.
Quarterly bulletin.
Weekly health message.

KANSAS STATE BOARD OF HEALTH

Board of health:
Clay E. Coburn, M. D., president, Kansas City.
H. L. Aldrich, M. D., Caney.
George I. Thacher, M. D., Waterville.
R. S. Haury, M. D., Newton.
Charles W. Robinson, M. D., Atchison.
H. A. Browne, M. D., Galena.
L. V. Turgeon, M. D., Wilson.
J. G. Stewart, M. D., Topeka.
Herbert Smith, M. D., Pittsburg.
A. B. Mitchell, LL. B., Lawrence.
Executive health officer:
*Earle G. Brown, M. D., secretary State board of health, Topeka.
Division of vital statistics:
*C. L. Miller, M. D., State registrar.
Division of communicable diseases:
*C. H. Kinnaman, M. D., epidemiologist, Topeka.
Division of foods and drugs:
*Thomas I. Dalton, Ph. C., assistant chief food and drug inspector, Topeka.
Division of child hygiene:
*H. R. Ross, M. D., chief, Topeka.
Division of sanitation:
Earnest Boyce, chief, Lawrence.
Division of public-health education:
*Earle G. Brown, M. D., director, Topeka.
Water and sewage laboratories at Kansas University:
Earnest Boyce, director, Lawrence.
Food laboratory at Kansas University:
H. P. Cady, director.
Drug laboratory at Kansas University:
Prof. L. D. Havenhill, director of drug analysis, Lawrence.
Food laboratory at Kansas Agricultural College:
Prof. H. H. King, director of food analysis, Manhattan.
Public health laboratory, Topeka:
*Ross L. Laybourn, bacteriologist, in charge.
Appropriations for year ending June 30 1935:

	Salaries	Total
Executive	$4,400	$6,000
Division of communicable diseases	4,800	15,210
Division of food and drugs	8,140	12,140
Division of child hygiene	5,760	8,000
Division of cooperative county health work		6,000
Public health laboratory	4,010	8,300
Division of sanitation (engineering, water, and sewage)		2,400
Board members	200	800
Total	27,310	58,850

Other sources of revenue:
Marriage fees, approximately $20,000.
Water and ice analysis fees, approximately $14,000.
Publications issued by health department:
Biennial report.
Weekly morbidity report.

KENTUCKY STATE DEPARTMENT OF HEALTH

Department of health:
E. M. Howard, M. D., president, Harlan.
George S. Coon, M. D., Louisville.
A. T. McCormack, M. D., secretary, Louisville.
J. Watts Stovall, M. D., Grayson.
John H. Blackburn, M. D., Bowling Green.
W. H. Fuller, M. D., Mayfield.
A. W. Davis, M. D., Madisonville.
C. J. Johnson, D. O., Louisville.
James J. Goodwin, Louisville.
Executive health officer:
*A. T. McCormack, M. D., D. P. H., State health commissioner, Louisville.
Bureau of county health work:
*P. E. Blackerby, M. D., assistant State health commissioner, Louisville.
*V. A. Stilley, M. D., assistant field director, Benton.
Bureau of vital statistics:
*J. F. Blackerby, director, Louisville.
Bureau of bacteriology:
*Lillian H. South, M. D., director, Louisville.
Bureau of sanitary engineering:
*F. C. Dugan, C. E., director, Louisville.
Bureau of food, drugs, and hotels:
*Sarah Vance Dugan, director, Louisville.
Bureau of venereal diseases:
Jethra Hancock, M. D., Louisville.
Bureau of public health nursing:
*Margaret L. East, R. N., director, Louisville.
Bureau of maternal and child health:
*Annie S. Veech, M. D., director, Louisville.
Bureau of prevention of trachoma and blindness:
United States Trachoma Hospital:
*Robert Sory, M. D., medical officer in charge.
Bureau of budget:
*Elva V. Grant, director, Louisville.
Bureau of epidemiology:
*M. H. Jensen, M. D., director, Louisville.
Bureau of tuberculosis and State tuberculosis sanatorium:
*Paul A. Turner, M. D., director and superintendent, Louisville.
Bureau of dental health:
J. F. Owen, D. D. S., director, Lexington.
Bureau of public health education:
*John W. Kelly, director.

Appropriations for fiscal year ending June 30, 1935:

Central administration for all departments	$215,200
Full-time county health departments	314,000
State tuberculosis sanatorium	52,500
Total	581,700

Publications issued by health department:
Monthly bulletin.

LOUISIANA DEPARTMENT OF HEALTH

State board of health:
J. A. O'Hara, M. D., president, New Orleans.
S. E. Graham, M. D., Melville.
S. J. Couvillon, M. D., Moreauville.
J. L. Kelly, M. D., Oak Grove.
(Other members to be appointed.)
Fannie B. Nelken, secretary.
Executive health officer:
*J. A. O'Hara, M. D., president State board of health, New Orleans.
Bacteriologist:
*W. H. Seemann, M. D., New Orleans.
Registrar of vital statistics:
*P. A. Kibbe, M. D., New Orleans.

Bureau of communicable diseases:
C. L. Brown, M. D., New Orleans.
Bureau of mental hygiene:
H. R. Unsworth, M. D., New Orleans.
Bureau of public health administration:
*R. W. Todd, M. D., U. S. P. H. S., director, New Orleans.
*George S. Bete, executive assistant, New Orleans.
Sanitary engineer:
*John H. O'Neill, New Orleans.
Analyst:
*Cassius L. Clay, New Orleans.
Bureau of animal industry:
*G. T. Jackson, D. V. S., director, New Orleans.
Sanitary inspection:
*Peter Rohrs, Jr., chief, New Orleans.
Auditor:
*Phil Arras, New Orleans.

Appropriations for fiscal year:

1934-35	$395,000
1935-36	431,000

Publications issued by health department:
Quarterly bulletin.
Biennial report.
Miscellaneous leaflets.

MAINE DEPARTMENT OF HEALTH AND WELFARE

Bureau of health:
George H. Coombs, M. D., director, Augusta.
Advisory council of health and welfare:
Miss Sally P. Moses, Bangor.
George W. Lane, Jr., Auburn.
Mrs. Dora B. Pinkham, Fort Kent.
Walter G. Davis, Portland.
Mrs. Helen C. Donahue, Portland.
E. V. Call, M. D., Lewiston.
Division of administration:
*George H. Coombs, M. D., Augusta.
Division of communicable diseases:
*George H. Coombs, M. D., Augusta.
Division of laboratories:
*A. H. Morrell, M. D., Augusta.
Division of sanitary engineering:
*Elmer W. Campbell, D. P. H., Augusta.
Division of vital statistics:
*George H. Coombs, M. D., State registrar, Augusta.
Division of social hygiene:
*George H. Coombs, M. D., Augusta.
Division of public health nursing and child hygiene:
*Edith L. Soule, R. N., Augusta.
Division of dental hygiene:
*Dorothy Bryant, D. H., Augusta.
District health officers:
*J. L. Pepper, M. D., South Portland.
*R. L. Mitchell, M. D., Lewiston.
*J. W. Loughlin, M. D., Newcastle.
*B. F. Porter, M. D., Caribou.

Appropriations for fiscal year ending June 30, 1935:

Salaries and clerk hire	$37,000
Office expense and epidemic fund	19,000
District and local health officers	32,000
Venereal-disease control work	9,700
Maternity and child-welfare work	25,000
Branch State laboratory, Caribou	2,900
Aid for typhoid carriers	4,800
Completion of vital records of the State	400
Infantile-paralysis control	2,000
Total	134,000

Other sources of revenue:
Census Bureau, Washington, D. C., about $533.
License fees for camps, roadside eating and lodging places, about $11,000 (estimated).

MARYLAND DEPARTMENT OF HEALTH

Board of health:
Robert H. Riley, M. D., Dr. P. H., chairman, Baltimore.
Thomas S. Cullen, M. D., Baltimore.
Wm. P. Lane, Jr., attorney general, Baltimore.
William W. Ford, M. D., Baltimore.
Huntington Williams, M. D., Dr. P. H., Baltimore.

Board of health—Continued.
Tolley A. Biays, C. E., Baltimore.
Benjamin C. Perry, M. D., Bethesda.
E. F. Kelly, Phar. D., Baltimore.
Burt B. Ide, D. D. S., Baltimore.
Executive health officer:
*Robert H. Riley, M. D., Dr. P. H., director of health, Baltimore.
Division of personnel and accounts:
*Walter N. Kirkman, chief, Baltimore.
Division of oral hygiene:
*Richard C. Leonard, D. D. S., chief, Baltimore.
Division of legal administration:
*J. Davis Donovan, LL. B., chief, Baltimore.
Committee on public health education:
*Gertrude B. Knipp, secretary, Baltimore.
Bureau of communicable diseases:
*Robert H. Riley, M. D., Dr. P. H., chief, Baltimore.
*C. H. Halliday, M. D., epidemiologist, Baltimore.
*C. W. G. Rohrer, M. D., Ph. D., diagnostician, Baltimore.
Bureau of vital statistics:
*John Collinson, M. D., Dr. P. H., chief, Baltimore.
Food and drug commissioner:
*A. L. Sullivan, chief, Baltimore.
Deputy food and drug commissioner:
*R. L. Swain, Phar. D., LL. B.
Bureau of bacteriology:
*C. A. Perry, chief, Baltimore.
Bureau of sanitary engineering:
*Abel Wolman, B. S. E., chief, Baltimore.
Bureau of chemistry:
*John C. Krantz, Jr., Ph. D., chief, Baltimore.
Bureau of child hygiene:
*J. H. Mason Knox, Jr., Ph. D., M. D., chief, Baltimore.
Appropriations for fiscal year ending Sept. 30, 1935, $401,332.
Publications issued by health department:
Annual report.
Weekly News Letter.
*Monthly bulletin.

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

Public health council:
Henry D. Chadwick, M. D., chairman, Boston.
Roger I. Lee, M. D., Boston.
Francis H. Lally, M. D., Milford.
Richard P. Strong, M. D., Boston.
Sylvester E. Ryan, M. D., Springfield.
James L. Tighe, Holyoke.
Gordon Hutchins, Concord.
Executive health officer:
*Henry D. Chadwick, M. D., State commissioner of public health, Boston.
Secretary:
*Alice M. Nelson.
Division of administration:
(Under direction of commissioner.)
Division of communicable diseases:
*Gaylord W. Anderson, M. D., director, Boston.
Division of sanitary engineering:
*Arthur D. Weston, C. E., director and chief engineer, Boston.
Division of biologic laboratories:
*Elliott S. Robinson, M. D., director and pathologist, Boston.
Division of food and drugs:
*Hermann C. Lythgoe, director and analyst, Boston.
Division of child hygiene:
*M. Luise Diez, M. D., director, Boston.
Division of tuberculosis sanatoria:
*Alton S. Pope, M. D., director, Boston.
Division of adult hygiene:
*Herbert L. Lombard, M. D., director, Boston.
Appropriations for department of public health, 1934:
Division of administration:

Salary of commissioner	$6,025
Personal services	17,080
Services other than personal	9,262

Appropriations for department of public health, 1934—Continued.	
Division of child hygiene:	
Personal services of director and assistants	$34,140
Services other than personal	16,000
Personal services in connection with maternal and infant hygiene	21,254
Expenses in connection with maternal and infant hygiene	10,400
Division of communicable diseases:	
Personal services of director, district health officers, etc	67,100
Services other than personal	14,250
Personal services in connection with control of venereal diseases	12,682
Expenses in connection with control of venereal diseases	28,000
Wassermann Laboratory:	
For personal services	15,700
For expenses of laboratory	5,200
Antitoxin and vaccine laboratory:	
For personal services	63,530
Other services	37,000
Inspection of food and drugs:	
For personal services	49,540
Other services	12,100
For administering the shellfish law:	
Personal services	1,871
Other services	870
Water supply and disposal of sewage, engineering division:	
For personal services	66,127
For other services	17,900
Water supply and disposal of sewage, water and sewage laboratories:	
For personal services	37,300
For other services	9,200
Division of tuberculosis:	
For personal services	33,394
Services other than personal	6,150
For personal services of tuberculosis clinic units	44,440
Services other than personal (clinic units)	26,000
Payment of subsidies	451,000
For maintenance of and for certain improvements at the Lakeville, North Reading, Rutland, and Westfield State sanatoria	1,070,540
Division of adult hygiene:	
For personal services	40,020
For other expenses	33,400
Cancer hospital at Norfolk:	
For maintenance of and for certain improvements	238,295
Total	2,497,563

MICHIGAN DEPARTMENT OF HEALTH

Advisory council of health:
- Robert B. Harkness, M. D., Houghton.
- Chalmers J. Lyons, D. D. Sc., Ann Arbor.
- Louis J. Hirschman, M. D., Detroit.
- W. E. McNamara, M. D., Lansing.
- George J. Curry, M. D., Flint.

Executive health officer:
- *C. C. Slemons, M. D., Dr. P. H., State health commissioner, Lansing.

Bureau of engineering:
- *E. D. Rich, C. E., director.
- *John M. Hepler, assistant engineer.
- *Willard F. Shephard, assistant engineer.
- *Raymond J. Faust, assistant engineer.
- *Orla E. McGuire, assistant engineer.

Bureau of laboratories:
- *C. C. Young, Ph. D., Dr. P. H., director.
- *Wm. E. Bunney, Ph. D., associate director.
- *Minna Crooks, bacteriologist.
- *M. B. Kurtz, D. V. M., serologist.
- *Pearl Kendrick, associate director, west Michigan division.
- *Ora Mills, associate director, Houghton branch.
- *A. B. Haw, physiological chemist.
- *Roy W. Pryor, Dr. P. H., immunologist.
- *Merle M. Woodward, toxicologist.
- *G. D. Cummings, Ph. D., assistant director.

Bureau of child hygiene and public health nursing:
- *Lillian R. Smith, M. D., director.
- *Goldie Corneliuson, M. D., physician.
- *Ida M. Alexander, M. D., prenatal consultant.
- *Helen de Spelder Moore, R. N., assistant director.

Bureau of records and statistics:
- *W. J. V. Deacon, M. D., director.

Bureau of education:
- *Marjorie Delavan, director.
- *Pearl Turner, assistant idirector.
- *Melita Hutzel, lecturer.

Bureau of embalming:
- *Frank J. Pienta, director.

Bureau of communicable diseases and rural hygiene:
- *C. D. Barrett, M. D., C. P. H., director.
- *Filip Forsbeck, M. D., associate director, in charge of communicable diseases.
- *M. B. Beckett, M. D., C. P. H., field agent, in charge of rural hygiene.
- *A. W. Newitt, M. D., C. P. H., field epidemiologist.

Bureau of mouth hygiene:
- *William R. Davis, D. D. S., director.

Appropriations for fiscal year ending June 30, 1935:	
Personal services	$200,500
Supplies / Contractual service	97,250
Outlay for equipment	7,700
Total	305,450
County health departments	48,000
Smallpox vaccine, toxoid manufacturing	5,000
Beaver Island, physician	2,200
Total	360,650
Special appropriation	20,000
Grand total	380,650

Publications issued by health department:
- Monthly bulletin.
- Annual report.
- Communicable disease pamphlets.
- Sex hygiene pamphlets.
- Child hygiene pamphlets.
- Engineering bulletins.
- Mouth hygiene pamphlets.
- Scientific reprint series.
- Rules and regulations.

MINNESOTA DEPARTMENT OF HEALTH

Board of health:
- N. O. Mortensen, M. D., president, St. Paul.
- Frederic Bass, C. E., vice president, Minneapolis.
- Erling S. Platou, M. D., Minneapolis.
- J. A. Thabes, Sr., M. D., Brainerd.
- Helen Hughes Hielscher, M. D., Mankato.
- S. Z. Kerlan, M. D., Aitkin.
- E. T. Fitzgerald, M. D., Morris.
- A. S. Malinowski, C. E., St. Paul.
- Thomas G. Bell, Duluth.

Executive health officer, State Office Bldg., St. Paul:
- *A. J. Chesley, M. D., secretary and executive officer.

Division of administration, State Office Bldg., St. Paul:
- *O. C. Pierson, director.

Division of vital statistics, State Office Bldg., St. Paul:
- *Gerda C. Pierson, director.

Division of hotel inspection, State Office Bldg., St. Paul:
- *E. H. Berg, State hotel inspector.

Division of preventable diseases (including venereal diseases), University Campus, Minneapolis:
- *C. McDaniel, M. D., director.
- *Lucy Heathman, Ph. D., chief of laboratories.
- *W. P. Greene, M. D., senior epidemiologist.
- *Robert E. Rock, M. D., epidemiologist.
- *Robert N. Barr, M. D., epidemiologist.

Division of sanitation, University Campus, Minneapolis:
- *H. A. Whittaker, director.
- *O. E. Brownell, C. E., senior sanitary engineer.

Division of child hygiene, university campus, Minneapolis:
Everett C. Hartley, M. D., director.
*Olivia Peterson, R. N., superintendent of public-health nursing.

Appropriations for fiscal year ending June 30, 1935:

Divisions of administration and vital statistics:	
Salaries	$30,000
Expenses	8,000
Providing free antitoxin and other biologics	9,000
For aid to typhoid carriers	7,500
For printing lists of persons licensed to practice the healing arts	450
Division of preventable diseases:	
Preventable diseases and laboratory	65,000
Venereal disease control and venereal disease education	20,600
Division of sanitation:	
Sanitary engineering and laboratory	25,000
Stream pollution survey	10,000
Division of child hygiene:	
Protection for maternity and infancy	28,000
Indian health work (nursing service)	9,000
Division of hotel inspection:	
Hotel inspection	33,000
Total	245,550

Publications issued by health department:
Educational pamphlets.

MISSISSIPPI STATE BOARD OF HEALTH

Board of health:
J. W. Lipscomb, M. D., president, Columbus.
Felix J. Underwood, M. D., secretary, Jackson.
S. E. Eason, M. D., New Albany.
L. B. Austin, M. D., Rosedale.
W. A. Dearman, M. D., Gulfport.
B. J. Shaw, M. D., Slate Spring.
W. H. Frizell, M. D., Brookhaven.
John Darrington, M. D., Yazoo City.
W. H. Banks, M. D., Philadelphia.
William R. Wright, D. D. S., Jackson.
Executive health officer:
*Felix J. Underwood, M. D., secretary State board of health, Jackson.
Vital statistics:
*R. N. Whitfield, M. D., director, Jackson.
Child hygiene and public-health nursing:
*Felix J. Underwood, M. D., acting director, Jackson.
*Mary D. Osborne, R. N., associate director, public-health nursing, Jackson.
*Gladys Eyrich, supervisor oral hygiene, Jackson.
Hygienic laboratory:
*T. W. Kemmerer, M. D., director, Jackson.
Sanitary engineering:
*H. A. Kroeze, C. E., director, Jackson.
*N. M. Parker, D. V. S., State meat and milk supervisor, Jackson.
*C. M. Ledbetter, assistant State sanitary engineer, Jackson.
*Floyd Ratliff, State sanitary inspector, Jackson.
County health work:
*H. C. Ricks, M. D., C. P. H., director, Jackson.
*John A. Milne, M. D., M. P. H., assistant director, Jackson.
*Ora E. Phillips, R. N., supervising nurse.
*Joseph E. Johnston, field supervisor of sanitation, Jackson.
Tuberculosis control:
*Henry Boswell, M. D., director, Sanatorium.
*W. D. Hickerson, M. D., clinician, field tuberculosis diagnostic unit, Sanatorium.
Industrial hygiene:
*J. W. Dugger, M. D., director, Jackson.
Epidemiological unit:
*A. L. Gray, M. D., M. P. H., director, Jackson.
*Catherine Mayfield, bacteriologist.
*Margaret Meade, nurse-investigator.
State appropriations for period January 1 to December 31, 1934, $162,500; January 1 to December 31, 1935, $162,500.
Publications issued by health department:
Biennial report.
Health pamphlets.

MISSOURI STATE BOARD OF HEALTH

Board of health:
Emmett P. North, M. D., president, St. Louis.
P. T. Bohan, M. D., vice president, Kansas City.
W. T. Elam, M. D., St. Joseph.
W. L. Brandon, M. D., Poplar Bluff.
E. S. Smith, M. D., Kirksville.
T. S. Bourke, M. D., Kansas City.
E. T. McGaugh, B. L., M. D., State health commissioner, Jefferson City.
Executive health officer:
*E. T. McGaugh, B. L., M. D., State health commissioner, Jefferson City.
Epidemiology:
*E. K. Musson, M. D., M. P. H., epidemiologist.
Laboratories:
*C. F. Adams, B. Agr., M. D., director.
Sanitary engineering:
*Herbert Bosch, B. S., public health, engineer.
Vital statistics:
*W. F. Lunsford, M. D., M. P. H.
Child hygiene and cooperative county health work:
*H. S. Gove, M. D., director.
Public health nursing:
*Miss Helena Dunham, R. N., director.

Appropriations for the State board of health, biennial period, 1933-34:

Additions	$3,000
Repairs and replacements	6,000
Operation	41,250
Salaries	177,500
Total	227,750
Board of health fund:	
Personal service	15,000
Repairs and replacements	2,625
Operation	12,375
Total	30,000
Cosmetology and hairdressing:	
Personal service	23,322
Additions	578
Repairs and replacements	572
Operations	12,028
Total	36,500
Food and drug—From July 31, 1933, and 1934:	
Personal service	52,310
Operation	37,690
Total	90,000
Food and drug, personal services—1934 special session	10,000
Total	100,000

MONTANA DEPARTMENT OF PUBLIC HEALTH

Board of Health:
E. M. Porter, M. D., president, Great Falls.
George M. Jennings, M. D., Missoula.
L. H. Fligman, M. D., Helena.
E. G. Balsam, M. D., Billings.
B. L. Pampel, M. D., Livingston.
W. F. Cogswell, M. D., secretary.
Executive health officer:
*W. F. Cogswell, M. D., secretary, Helena.
Division of communicable diseases:
* J. H. Crouch, M. D., epidemiologist, Helena.
Division of child welfare:
* W. F. Cogswell, M. D., acting director, Helena.
* Florence Jordan, assistant director, Helena.
Division of food and drugs:
* J. W. Forbes, director, Helena.
Division of vital statistics:
* W. F. Cogswell, M. D., State registrar, Helena.
* L. L. Benepe, deputy State registrar, Helena.
Division of water and sewage:
* H. B. Foote, director, Helena.
W. M. Cobleigh, consulting sanitary engineer, Bozeman.
* Oliver Morgan, analyst, Helena.
Hygienic laboratory:
* Fred D. Stimpert, director, Helena.
* Edith Kuhns, technician, Helena.
E. D. Hitchcock, M. D., consulting bacteriologist, Great Falls.

Appropriations for the years ending June 30:

	1934	1935
Salaries	$23, 300	$23, 300
Operating expenses	15, 750	15, 750
Capital repairs and replacements	500	500
Revolving fund (estimated)	13, 000	13, 000
Division of child welfare	10, 500	10, 500
Board of Entomology (Rocky Mountain spotted fever work)	3, 000	3, 000
Total	66, 050	66, 050

NEBRASKA DEPARTMENT OF HEALTH

Executive health officer:
*P. H. Bartholomew, M. D., acting director of health, Lincoln.
Collaborating epidemiologist:
*P. H. Bartholomew, M. D., Lincoln.
Bacteriologist:
*L. O. Vose, Lincoln.
Division of venereal diseases:
*P. H. Bartholomew, M. D., director, Lincoln.
Statistician:
*Jean Barrett, Lincoln.
Medical examining board:
W. R. Boyer, M. D., Pawnee City.
H. J. Lehnhoff, M. D., Lincoln.
P. A. DeOgny, M. D., Milford.
Appropriations for biennial period ending June 30, 1935:

Salary of director	$7, 200
Salaries	20, 000
Maintenance	10, 000
Total	37, 200

NEVADA STATE BOARD OF HEALTH

State board of health:
Morley Griswold, Acting Governor, president, Carson City.
Edward E. Hamer, M. D., secretary and State health officer, Carson City.
W. G. Greathouse, secretary of state.
John Fuller, M. D., Reno.
C. W. West, M. D., Reno.
Executive health officer:
*Edward E. Hamer, M. D., State health officer, Carson City.
State hygienic laboratory at State university:
*Vera E. Young, acting director, Reno.
Appropriations for period from July 1, 1933, to June 30, 1935:

Salary of secretary	$5, 000
Salary of clerk	2, 813
Traveling expenses	1, 500
Office postage	250
Office supplies, heat, rent, and light	1, 800
Office telephone and telegraph	300
Equipment	200
Registration of births and deaths	350
Purchase of diphtheria and other dangerous disease antitoxin	500
Total	12, 713

Publications issued by health department:
Biennial report.
Special bulletins.

NEW HAMPSHIRE STATE BOARD OF HEALTH

Board of health:
George C. Wilkins, M. D., Manchester.
Barbara Beattie, M. D., Littleton.
John G. Winant, Governor (term expires Jan. 1, 1935).
Francis W. Johnston, attorney general, Claremont.
James W. Jameson, M. D., Concord.
Executive health officer:
*Charles Duncan, M. D., secretary State board of health, Concord.
*Harriet I. Parkhurst, chief clerk, Concord.
Division of maternity, infancy, and child hygiene:
*Mary D. Davis, R. N., director and supervising nurse, Manchester.
Department of vital statistics:
*Charles Duncan, M. D., registrar, Concord.
*Doris P. Bartlett, chief clerk, Concord.
Division of chemistry and sanitation:
*Charles D. Howard, chief of division, Concord.
*Frederick Vintinner, assistant chemist, Concord.
*Harriet L. Albee, assistant chemist and bacteriologist, Concord.
*Leonard W. Trager, assistant sanitary engineer, Concord.
*Russell A. Eckloff, inspector.
*Joseph X. Duval, chief inspector, Concord.
Diagnostic and pathological department:
*William R. Macleod, serologist and diagnostic bacteriologist, Concord.
H. N. Kingsford, M. D., pathologist, Hanover.
*Benjamin Jewell, assistant in pathological laboratory, Concord.
Venereal-disease division:
*Charles A. Weaver, M. D., Manchester.

Appropriations for fiscal year ending June 30, 1935:

State board of health	$50, 548
Laboratory of hygiene	17, 490
Vital statistics	4, 290
Cancer clinic fund	10, 000
Total	82, 328

Publications issued by health department:
Bulletin.
Biennial report.

NEW JERSEY DEPARTMENT OF HEALTH

Board of health:
S. A. Cosgrove, M. D., president, Jersey City.
Mrs. Helen M. Berry, vice president, Newark.
Charles I. Lafferty, Atlantic City.
Margaret L. McNaughton, Jersey City.
H. E. Winter, V. M. D., Plainfield.
J. E. H. Guthrie, D. D. S., Newark.
Clyde Potts, C. E., Morristown.
Irvin E. Deibert, M. D., Camden.
James E. Russell, Trenton.
John V. Bishop, Columbus.
Executive health officer:
*J. Lynn Mahaffey, M. D., director of health, Trenton.
Bureau of bacteriology:
*John V. Mulcahy, chief, Trenton.
Bureau of chemistry:
*John E. Bacon, chief, Trenton.
Bureau of administration:
*Charles J. Merrell, chief, Trenton.
Bureau of food and drugs:
*Walter W. Scofield, chief, Trenton.
Bureau of public health education:
*Edwin C. Lanigan, chief, Trenton.
Bureau of child hygiene:
Julius Levy, M. D., consultant, Trenton.
Bureau of local health administration:
Wm. H. McDonald, acting chief, Trenton.
Bureau of engineering:
*H. P. Croft, chief, Trenton.
Bureau of vital statistics:
*David S. South, chief, Trenton.
Bureau of venereal-disease control:
A. J. Casselman, M. D., consultant, Trenton.
Appropriations for fiscal year ending June 30, 1935:

Salaries	$234, 447
Miscellaneous	59, 300
Child hygiene	101, 812
Venereal-disease control	25, 020
Total	420, 579

Publications issued by health department:
Monthly bulletin.
Annual report.

NEW MEXICO BUREAU OF PUBLIC HEALTH

Board of public welfare:
Robert O. Brown, M. D., president, Santa Fe.
Max Nordhaus, Albuquerque.
Mrs. David Chavez, Jr., secretary, Santa Fe.
Mrs. Orren Beaty, Lovington.
J. O. McConvery, Santa Fe.

Executive health officer:
*J. Rosslyn Earp, Dr. P. H., director of public health, Santa Fe.
Division of sanitary engineering and sanitation:
*Paul S. Fox, M. S. in C. E., chief, Santa Fe.
Division of county health work:
*O. H. Douthirt, M. D , director, Santa Fe.
Acting State supervisor of public-health nursing:
*Grace M. Coffman, R. N., Santa Fe.
Public-health laboratory:
*Myrtle Greenfield, chief, Albuquerque.
State registrar:
*Miss Billy Tober, Santa Fe.
Appropriation for years 1933-34 and 1934-35, per annum, $35,900. Fiscal year ends June 30.

NEW YORK STATE DEPARTMENT OF HEALTH

Public-health council:
Simon Flexner, M. D., LL. D., chairman, New York.
Homer Folks, LL. D., vice chairman, Yonkers.
Livingston Farrand, M. D., Ithaca.
Walter A. Leonard, M. D., Cambridge.
Henry N. Ogden, C. E., Ithaca.
Frederick F. Russell, M. D., New York.
Thomas Parran, Jr., M. D. (ex officio), commissioner of health, Albany.
Executive health officer:
*Thomas Parran, Jr., M. D., LL. D., State commissioner of health, Albany.
Deputy commissioner of health:
*Paul B. Brooks, M. D., Albany.
Assistant commissioner for local health administration:
*Edward S. Godfrey, Jr., M. D., Albany.
Administrative officer:
*Edmund Schreiner, LL. B., Albany.
Administrative finance officer:
*Clifford C. Shoro, Albany.
Division of public-health education:
*B. R. Rickards, director, Albany.
Division of sanitation:
*Charles A. Holmquist, C. E., director, Albany.
Division of vital statistics:
*Joseph V. De Porte, Ph. D., director, Albany.
Division of maternity, infancy, and child hygiene:
*Elizabeth M. Gardiner, M. D., director, Albany.
Division of communicable diseases:
*George H. Ramsey, M. D., director, Albany.
Division of tuberculosis:
*Robert E. Plunkett, M. D., director, Albany.
Division of social hygiene:
*Albert Pfeiffer, M. D., director, Albany.
Division of laboratories and research:
*August B. Wadsworth, M. D., director, Albany.
Division of public-health nursing:
*Marion W. Sheahan, R. N., director, Albany.
Division of orthopedics:
*Walter J. Craig, M. D., director, Albany.
Division of cancer control:
*Burton T. Simpson, M. D., director.
State institute for the study of malignant diseases, Buffalo:
*Burton T. Simpson, director.
New York State Hospital for Incipient Pulmonary Tuberculosis, Ray Brook:
*H. A. Bray, M. D., superintendent.
New York State Reconstruction Home, West Haverstraw:
*John M. Kelly, superintendent.
Appropriations for fiscal year ending June 30, 1935:

Personal service	$1,722,042
Maintenance and operation	959,900
State aid to county laboratories	127,600
State aid to county health activities	457,331
Construction and permanent betterments	507,905
Total	3,624,778

Other sources of revenue:
Fees from certified transcripts of birth, death, and marriage certificates, $3,378.20 per annum.
Licensing laboratories, $424.
Sale of serums, $1,943.98.
Licensing of embalmers and undertakers, $5,699.50.
Registration of embalmers and undertakers, $26,583.
Other sources of revenue—Continued.
Rental of radium, estimated, $510.41.
Care of county cases at reconstruction home, $81,975.
Refund of transportation of discharged patients from tuberculosis hospitals, Ray Brook, estimated, $1,000.
Publications issued by health department:
Weekly Health News.
Monthly Vital Statistics Review.
Annual Report.

NORTH CAROLINA STATE BOARD OF HEALTH

Board of health:
Carl V. Reynolds, M. D , president, Asheville.
S. D. Craig, M. D., vice president, Winston-Salem.
G. G. Dixon, M. D., Ayden.
J. N. Johnson, D. D. S., Goldsboro.
H. Leo Large, M. D., Rocky Mount.
H. G. Baity, Chapel Hill.
W. T. Rainey, M. D., Fayetteville.
Hubert B. Haywood, M. D., Raleigh.
James P. Stowe, Ph. G., Charlotte.
Executive health officer:
*Carl V. Reynolds, M. D., acting State health officer, Raleigh.
Division of laboratories and vital statistics:
*John H. Hamilton, M. D., director, Raleigh
*R. T. Stimpson, M. D., bureau of vital statistics, Raleigh.
Division of sanitary engineering:
*Warren H. Booker, C. E., director, Raleigh.
Division of preventive medicine:
*G. M. Cooper, M. D., director, Raleigh.
(a) Maternity and infancy.
(b) Health education.
Division of county health work:
M. V. Ziegler, M. D., director, pro tem, Raleigh.
*R. E. Fox, M. D., M. P. H., Raleigh.
Division of epidemiology:
*J. C. Knox, M. D., M. P. H., director, Raleigh.
Division of oral hygiene:
*Ernest A. Branch, D. D. S., director, Raleigh.
Appropriation for fiscal year ending June 30, 1934, $215,310.
Other sources of revenue: Special fees, $17,250.

NORTH DAKOTA DEPARTMENT OF PUBLIC HEALTH

Advisory health council:
John Crawford, M. D., New Rockford.
Agnes Stucke, M. D., Garrison.
C. W. Livingston, D. D. S., Minot.
P. O. Sathor, attorney general, ex officio, Bismarck.
Arthur E. Thompson, superintendent of public instruction, ex officio, Bismarck.
Maysil M. Williams, M. D., C. P. H., State health officer.
Executive health officer:
*Maysil M. Williams, M. D., C. P. H., State health officer, Bismarck.
Bureau of child hygiene and public health nursing:
— — —
Bureau of venereal diseases:
(No appropriation.)
Bureau of sanitary engineering:
*Mark D. Hollis.
Bureau of vital statistics:
(No appropriation.)
Appropriations for biennial period ending June 30, 1935:

Salary State health officer	$4,800
Director of preventable diseases	2,000
Bureau of child hygiene and public health nursing	6,113
Director of division of child hygiene	3,584
Three stenographers	2,400
One nurse	2,520
Postage	700
Office supplies	800
Printing and lithographing	500
Miscellaneous	250
Travel expense	1,500
Tabulating, indexing, filing, and binding birth, death, and marriage certificates	1,000

OHIO DEPARTMENT OF HEALTH

Public-health council:
H. G. Southard, M. D., chairman, Columbus.
James E. Bauman, secretary.
G. D. Lummis, M. D.
R. M. Calfee.
W. I. Jones, D. D. S.
(Vacancy.)
Executive health officer:
*Walter H. Hartung, M. D., director of health, Columbus.
Assistant director of health:
*James E. Bauman.
Division of administration:
*James E. Bauman, chief.
*C. A. Orrison, chief clerk.
Bureau of publicity:
*Paul Mason, chief.
Bureau of local health organization:
*R. W. DeCrow, M. D., chief.
Division of communicable diseases:
*Finley Van Orsdall, M. D., chief.
Bureau of tuberculosis:
*W. J. Smith, M. D.
Bureau of venereal diseases:
*W. P. Johnson M. D.
Bureau of prevention of blindness:
*W. P. Johnson, M. D.
Division of sanitary engineering:
*F. H. Waring, chief.
Bureau of plumbing inspection:
*George Woods, chief.
Division of vital statistics:
*Irva C. Plummer, chief.
Division of laboratories:
*Leo F. Ey, chief.
Division of hygiene:
E. R. Hayhurst, M. D., chief.
Bureau of hospitals:
*Clara E. Reeder, R. N., chief.
Bureau of child hygiene:
*A. L. Van Horn, M. D., chief.
Bureau of occupational diseases:
E. R. Hayhurst, M. D., chief.
Appropriations for 12 months ending Dec. 31, 1931:

Personal services	$178,486.50
Maintenance	49,562.00
State aid for health districts	150,000.00
Total	378,048.50

Publications issued by health department:
Ohio Health News (semimonthly).

OKLAHOMA DEPARTMENT OF PUBLIC HEALTH

Executive health officer:
Charles M. Pearce, M. D., State health commissioner, Oklahoma City.
Assistant State health commissioner:
*J. P. Folsom, Oklahoma City.
Bureau of vital statistics.
*Juanita Johnston Smith, registrar.
Bureau of laboratories:
*Burley Walker, bacteriologist.
*Katherine Harris, assistant bacteriologist.
*Taylor Rogers, chemist.
*Floyd Whipple, assistant chemist.
Bureau of sanitary engineering:
*H. J. Darcey, B. S. in Engineering, director.
Appropriations for fiscal years ending June 30, 1934, and 1935:

Administration:	
Commissioner	$3,840
Assistant commissioner	2,100
Secretary and stenographer	1,320
Bookkeeper	1,500
Bureau of diagnostic laboratory:	
Chemist	2,400
Assistant chemist	1,500
Bacteriologist	1,800
Assistant bacteriologist	1,800
Record clerk	1,200
Extra help- janitor	900
Manufacture typhoid and toxoid vaccine	2,500
Bureau of sanitary engineering:	
Engineer	2,800

Appropriations for fiscal years ending June 30, 1934, and 1935—Continued.

Bureau of pure food, drugs, and sanitary inspection:	
Inspectors (4 at $1,500 each)	$6,000
Bureau of vital statistics:	
Registrar	2,000
Assistant registrar	1,200
Statistical clerks (2 at $1,200)	2,400
Travel, administration	6,000
Communication	3,500
Printing, administration	2,500
Office supplies	500
Medical supplies	7,000
Office equipment	250
Laboratory equipment	900
Bureau of epidemiology, Bureau of rural sanitation and disease control in the rural districts, and dental health education	17,500
Malaria control	7,500
Registrars of vital statistics	20,000
Total	100,910

OREGON STATE BOARD OF HEALTH

Board of health:
Albert Mount, M. D., president, Oregon City.
J. P. Brennan, M. D., vice president, Pendleton.
Robert L. Benson, M. D., Portland.
H. H. Foskett, M. D., Portland.
N. E. Irvine, M. D., Lebanon.
J. H. Rosenberg, M. D., Prineville.
J. H. Rossman, D. M. D., Portland.
Executive health officer:
***Frederick D. Stricker, M. D.**, secretary and State health officer. Portland,
Registrar of vital statistics:
*Frederick D. Stricker, M. D., Portland.
Division of public health nursing and child hygiene:
*Mary P. Billmeyer, R. N., Portland.
Director of laboratory:
*William Levin, D. P. H., Portland.
Appropriations for fiscal year ending December 31, 1933, $28,864.50.
Publications issued by health department:
Annual report.
Biennial report.
Pamphlets and posters.
Weekly letter.

PENNSYLVANIA DEPARTMENT OF HEALTH

Advisory health board:
Theodore B. Appel, M. D., chairman.
Ross V. Patterson, M. D., Philadelphia.
William G. Turnbull, M. D., Philadelphia.
John M. Beck, M. D., Alexandria.
C. B. Auel, M. E., Pittsburgh.
Saylor T. McGhee, M. D., Lock Haven.
W. L. Eicher, Oakmont.
Sanitary water board:
Theodore B. Appel, M. D., chairman.
Lewis E. Staley, secretary of forests and waters, Harrisburg.
O. M. Deibler, commissioner of fisheries, Harrisburg.
Elmer A. Holbrook, Pittsburgh.
W. C. McCormick, Williamsport.
Edmund C. Wingerd, Chambersburg.
Executive bureau:
***Martha E. McBride-Dexter, M. D.**, secretary of health, Harrisburg.
*J. Bruce McCreary, M. D., deputy secretary of health, Harrisburg.
*Clifton T. Williams, comptroller, Harrisburg.
Division of accounts:
*E. J. McNamara, Harrisburg.
Division of supplies:
*Roy G. Miller, Harrisburg.
Division of laboratories:
*John L. Laird, M. D., Philadelphia.
Institutions:
Mont Alto sanatorium:
*R. H. McCutcheon, M. D., medical director, South Mountain.
Cresson sanatorium:
*T. H. A. Stites, M. D., medical director, Cresson.

Institutions—Continued.
Hamburg sanatorium:
*H. A. Gorman, M. D., medical director, Hamburg.
State hospital for crippled children:
*Francis S. Chambers, M. D., medical director, Elizabethtown.
*L. G. Ownes, business manager, Elizabethtown.
Bureau of health law enforcement:
*J. Bruce McCreary, M. D.
Division of school inspection:
*Charles W. Sheldon, M. D., county medical director, Wellsboro.
*John W. German, Harrisburg.
Pre-school division:
*Mary Riggs Noble, M. D., Harrisburg.
Division of public health education:
*J. C. Funk, LL. B., Harrisburg.
Division of drug control:
*Harold V. Smith, Harrisburg.
Division of restaurant hygiene:
*Howard M. Haines, Harrisburg.
Bureau of health conservation:
*J. Moore Campbell, M. D., Harrisburg.
Division of tuberculosis clinics:
*John B. Critchfield, M. D., Harrisburg.
Division of environmental hygiene:
*Howard F. Bronson, Harrisburg.
Division of genito-urinary diseases:
*Edgar S. Everhart, M. D., Harrisburg.
Division of epidemiology:
*S. J. Dickey, M. D., Harrisburg.
Bureau of nursing:
*Mrs. Mary S. Evans, R. N., Harrisburg.
Bureau of milk sanitation:
Wilbur K. Moffett, Harrisburg.
Bureau of sanitary engineering:
*W. L. Stevenson, Harrisburg.
Bureau of vital statistics:
*Emlyn Jones, M. D., Harrisburg.
Appropriation for biennial period ending May 31, 1935:

Salary of secretary	$20,000
General health purposes and maintenance of sanatoria and hospital for crippled children	5,257,000
Salinity survey of Delaware River	25,000
Total	5,302,000

PHILIPPINE ISLANDS BUREAU OF HEALTH

Director of health:
*Jacobo Fajardo, M. D., Manila.
Assistant to the director:
Regino G. Padua, M. D., D. T. M., Dr. P. H.
Council of hygiene, advisory board to the director of health:
Benito Valdes, M. D., chairman.
Gervasio de Ocampo, M. D.
Jose Albert, M. D.
Proceso Gabriel, M. D.
Hilario Lara, M. D., Dr. P. H.
Eulogio P. Revilla, LL. B.
Vicente P. Genato.
Jose P. Bantug, Ph. G., M. D., secretary.
Executive health officer:
*Jacobo Fajardo, M. D., director of health, Manila.
Division of administration:
*Leoncio Lopez-Rizal, M. D., chief.
*Geronimo Mercado, P. A., chief clerk.
Personnel section:
*Jose Villacorta, chief.
Records section:
*Victorio Yabot, chief.
Finance section:
*Lope O. Tayao, chief.
Property section:
*Bonifacio Mencias, M. D., chief.
Publicity section:
*Jose P. Bantug, Ph. G., M. D., chief.
Nursing section:
*Genera S. Manongdo, R. N., chief.
Nutrition section:
Frolian Eubanas, M. D., C. P. H., in charge.
Division of hospitals and dispensaries:
*Eusebio D. Aguilar, M. D., chief.
Baguio hospital:
*Teodoro C. Arvisu, M. D., chief.
Culion Leper Colony:
*Jose M. Raymundo, M. D., C. P. H., chief.
*Casimiro B. Lara, M. D., chief physician.
Insular Psychopathic Hospital:
Elias Domingo, M. D., chief alienist.
San Lazaro Hospital:
Catalino Gavino, M. D., chief.
Southern Islands Hospital:
Augusto P. Villalon, M. D., chief.
Division of maternal and child hygiene:
*Tranquilino Elicano, M. D., chief.
Section of school health supervision:
Mariano C. Icasiano, M. D., C. P. H., chief.
Section of puericulture center clinics:
Demetrio Belmonte, M. D., chief.
Section of maternity hospitals:
*Demetrio Belmonte, M. D., acting chief.
Section of midwifery instruction:
Eusebio Salud, M. D., chief.
Division of epidemiology:
*Eugenio Hernando, M. D., C. P. H., chief.
Section of vital statistics:
*Jose Guidote, M. D., C. P. H., chief.
Section of tuberculosis control:
*Sixto A. Francisco, M. D., chief.
Section of leprosy:
*Sulpicio Chiyuto, M. D., chief.
*Cristobal Manalang, M. D., D. T. M., chief pathologist.
*Jose Rodriguez, M. D., C. P. H., general supervisor of regional leprosy treatment stations.
Section of malaria control:
Antonio Ejercito, M. D., chief.
Section of control of other preventable diseases:
Angel Alonzo, M. D., C. P. H., chief.
Division of sanitation:
*Gabriel Intengan, M. D., chief.
Section of urban sanitation:
*Felipe Arenas, M. D., C. P. H., chief.
Section of rural sanitation:
*Enrique F. Ochoa, M. D., C. P. H., chief.
Section of sanitary engineering:
Manuel Mañosa, C. E., chief.
Section of immunization:
*Jose Sian, M. D., C. P. H., chief.
Appropriation for fiscal year ended December 31, 1931:

Salaries and wages	$160,512.25
Miscellaneous expenses	545,630.00
Furniture and equipment	2,802.00
Total	1,008,944.25

Special expenses:

For tuberculosis control work, act 3743	10,319.50
Continuation of treatment and diagnosis of lepers	93,635.50
Maintenance of regional treatment stations, etc	59,670.00
Aid to specially organized Provinces	156,978.50
Aid to Province of Ilocos Sur for the operation, maintenance, and equipment of the Cervantes Hospital	5,027.50
School of nursing in Baguio	3,286.50
Medicines and medical and surgical supplies for distribution to public-school dispensaries	2,000.00
General demonstration on a small scale of the practical control of beriberi	4,688.00
Control of malaria in the regularly specially organized Provinces and municipal districts	16,231.50
For insular aid for operation and maintenance of provincial hospitals	65,817.50
For the support of the Philippine Islands Antituberculosis Society	23,750.00

Appropriation for fiscal year ended December 31, 1934—Continued.
Special expenses—Continued.

For the operation of the maternity hospital, including the training of midwives in the city of Manila	21,120.50
Aid to puericulture centers	46,395.50
Total for special expenses	511,920.50
Less required savings in any item of salaries and wages, miscellaneous expenses, furniture and equipment, and special expenses	75,527.26
Grand total of appropriation	1,445,337.49

Publications issued by the bureau of health:
Daily Service News.
Weekly comparative epidemiological résumé.
Weekly résumé of births and deaths.
Monthly bulletin.
Health Messenger (monthly).
Annual report.
Service numbered pamphlets.
Reprints (unnumbered pamphlets).
Posters.

PUERTO RICO DEPARTMENT OF HEALTH

Insular board of health:
R. López Sicardó, M. D., chairman, San Juan.
W. A. Glines, M. D., San Juan.
E. Koppisch, M. D., San Juan.
Blas C. Herrero, M. D.
H. Cook, expert chemist.
Etienne Totti, civil and sanitary engineer, San Juan.
A. Rivera, veterinarian.
Manuel del Valle, D. D. S.
A. Ortiz Toro, attorney, San Juan.
Luis B. de la Vega, M. D., secretary.
Executive health officer:
***E. Garrido Morales, M. D., Dr. P. H.**, commissioner of health, San Juan.
*Antonio Arbona, M. D., assistant commissioner of health, section of public health, San Juan.
*Pedro Malaret, M. D., assistant commissioner of health, section of charities, San Juan.
Division of property and accounts:
*Rafael Méndez, chief, San Juan.
Bureau of general sanitation:
*W. F. Lippitt, M. D., chief, San Juan.
Bureau of sanitary engineering:
*Octavio Marcano, sanitary engineer, San Juan.
Biological laboratory:
*Oscar Costa Mandry, M. D., director, San Juan.
Chemical laboratory:
*R. del Valle Sárraga, Ph. C., director, San Juan.
Bureau of epidemiology and vital statistics:
*Abel de Juan, M. D., chief, San Juan.
Specialist in tuberculosis:
*J. Rodríguez Pastor, M. D., San Juan.
Bureau of malaria:
*Walter C. Earle, M. D., chief, San Juan.
Bureau of infant hygiene:
*Marta Robert de Romeu, M. D., chief, San Juan.
Bureau of public-health units:
*George C. Payne, M. D., chief, San Juan.
Division of social service:
*Beatriz Lassalle, superintendent, San Juan.
Appropriations for the fiscal year 1934–35:

Office of the commissioner	$97,891.42
Bureau of general sanitary inspection	40,107.00
Bureau of sanitary engineering	22,454.75
Biological laboratory	35,333.55
Chemical laboratory	17,640.20
Bureau of epidemiology and vital statistics	82,035.75
Bureau of malaria	41,067.00
Bureau of infant hygiene	12,996.75
Bureau of public-health units	306,281.25
Division of social service	5,680.00
Section of charities	622,306.35
Total	1,284,700.02

RHODE ISLAND PUBLIC HEALTH COMMISSION

Public health commission:
John Champlin, Jr., M. D., chairman, Westerly.
Berton W. Storrs, M. D., Portsmouth.
James H. Prior, M. D., Providence.
Bennett L. Richardson, M. D., Providence.
Charles H. Holt, M. D., Pawtucket.
Executive health officer:
***Lester A. Round, Ph. D.**, director of public health and State registrar, State Office Building, Providence.
Pathologist:
*Lester A. Round, Ph. D., Providence.
Division of laboratories:
Harry Pearse, director, North Providence.
Division of sanitary engineering and chemistry:
Charles L. Pool, director, Cranston.
Division of child hygiene:
Marion A. Gleason, M. D., director.
Division of communicable diseases and rural hygiene:
Morris L. Grover, M. D., M. P. H., director.
Division of vital statistics:
*Lester A. Round, Ph. D., director.
Division of social hygiene:
J. Edwards Kerney, M. D., director.

Appropriations for fiscal year ending June 30, 1934:

Executive department (including vital statistics and communicable diseases)	$48,420
Laboratories	31,963
Sanitary engineering and chemistry	15,930
Child hygiene	24,065
Social hygiene	8,495

Other sources of revenue:
Fees for medical licenses, each, $20.
Fees for midwives' licenses, each, $10.
Renewal of midwife licenses, each, $0.50.
Licenses for swimming pools, each, $20.
Licenses for camps, camp grounds, bathing beaches, bath houses, amusement resorts, each, $10.
Fees for certified copies of births, marriages, and deaths, each, $0.50.
Publications:
Annual health report.
Annual registration report.
Weekly and monthly morbidity report.
Monthly mortality report.

SOUTH CAROLINA STATE BOARD OF HEALTH

Executive committee, board of health:
William Egleston, M. D., chairman, Hartsville.
Robert Wilson, Jr., M. D., Charleston.
L. D. Boone, M. D., Aiken.
D. Lesesne Smith, M. D., Spartanburg.
E. A. Hines, M. D., Seneca.
W. R. Wallace, M. D., Chester.
J. Lee Carpenter, Ph. G., Greenville.
F. M. Routh, M. D., Columbia.
George Dick, D. D. S., Sumter.
John M. Daniel, attorney general, Columbia.
A. J. Beattie, comptroller general, Columbia.
Executive health officer:
***James A. Hayne, M. D.**, State health officer, Columbia.
Department of county health units:
*Ben F. Wyman, M. D., director, Columbia.
Laboratory:
*H. M. Smith, M. D., director, Columbia.
*J. R. Cain, chief bacteriologist, Columbia.
Bureau of vital statistics:
*Martin B. Woodward, M. D., director, Columbia (paid from Rockefeller Foundation).
*Nellie C. Cunningham, chief clerk, Columbia.
Bacteriologist and chemist:
F. L. Parker, Jr., M. D., Charleston.
South Carolina Tuberculosis Sanatorium:
*Ernest Cooper, M. D., superintendent, State Park.
Epidemiologist:

Appropriations for 12 months ending June 30, 1935:

Administrative office	$19,984
Rural sanitation—county health work	36,054
Bureau of vital statistics	4,538
Hygienic laboratory	9,144
Distribution of biologics	29,250
Total State board of health	100,070
Tuberculosis sanatoria	118,000
Director, bureau of vital statistics (supplemented with Rockefeller Foundation funds)	2,700

SOUTH DAKOTA STATE BOARD OF HEALTH

Board of health:
R. J. Quinn, M. D., president, Burke.
N. T. Owen, M. D., vice president, Rapid City.
H. J. Bartron, M. D., Watertown.
Carl A. Feige, M. D., Canova.
Park B. Jenkins, M. D., superintendent, Pierre.
Executive health officer:
***Park B. Jenkins, M. D.**, Pierre.
Division of vital statistics:
*Park B. Jenkins, M. D., Pierre.
Division of child hygiene:
*Lottie G. Bigler, M. D., Pierre.
Division of sanitary engineering:
*W. W. Towne, C. E., Pierre.
Division of medical licensure:
*Park B. Jenkins, M. D., Pierre.
Division of records and accounts:
*Katherine Niebuhr, Pierre.
Laboratories (at Vermillion):
J. C. Ohlmacher, M. D., Vermillion.
Appropriations:

	1933–34	1934–35
Salaries and wages	$10,000	$10,000
Biological products	2,000	2,000
Postage, communication, and travel	3,000	3,000
Crippled children	2,500	2,500
Dues	50	50
Infancy and maternity work	5,000	5,000
Office supplies, printing, and binding	2,500	2,500
Total	25,050	25,050

TENNESSEE DEPARTMENT OF PUBLIC HEALTH

Central Administration:
***W. C. Williams, M. D.**, commissioner, Nashville.
County and other local health work:
*W. C. Williams, M. D., director, Nashville.
Child hygiene and public health nursing:
Miss Donna Pearce, associate director, public health nursing, Nashville.
Division of vital statistics:
*R. H. White, Ph. D., director, Nashville.
Division of preventable diseases:
*J. A. Crabtree, M. D., C. P. H., director, Nashville.
Division of laboratories:
*W. H. Gaub, M. D., acting director, Nashville.
Division of sanitary engineering:
*Roy J. Morton, C. E., director, Nashville.
State appropriation for biennium July 1, 1933, to June 30, 1935, $350,885—$175,442.50 per annum.
Balance from old appropriation, supplementary, approximately $55,000 for fiscal year ending June 30, 1935.
Other sources of revenue:
Rockefeller Foundation International Health Division, $36,397.92 for year ending June 30, 1935.
Commonwealth fund, $33,044 for year ending June 30, 1935.
U. S. Public Health Service (trachoma only), $4,211 for year ending June 30, 1935.

TEXAS DEPARTMENT OF HEALTH

State board of health:
C. M. Rosser, M. D., chairman, Dallas.
J. M. Howe, C. E., vice chairman, Houston.
E. W. Wright, M. D., Bowie.
J. S. Wooten, M. D., Austin.
J. M. Frazier, M. D., Belton.
J. B. Brady, D. D. S., El Paso.
S. A. Woodward, M. D., Fort Worth.
J. S. McCelvey, M. D., Temple.
Henry Hein, Ph. G., San Antonio.
Executive health officer:
***John W. Brown, M. D.**, State health officer, Austin.
Bureau of child hygiene:
*H. N. Barnett, M. D., director.
Bureau of vital statistics:
*W. A. Davis, M. D., director.
Bureau of laboratories:
*S. W. Bohls, M. D., director.
Bureau of rural and county health work:
*K. E. Miller, M. D., U. S. P. H. S., director.
Bureau of communicable disease control and epidemiology:
*Charles D. Reece, M. D., director.
Bureau of sanitary engineering:
*V. M. Ehlers, C. E., director.
Bureau of foods and drugs:
*E. C. Koerth, Ph. G., director.
Bureau of public health education:
*L. E. Bracy, director.
Appropriations for fiscal years 1934–35, per annum, $180,380.

UTAH STATE BOARD OF HEALTH

Board of health:
Joseph R. Morrell, M. D., president, Ogden.
T. B. Beatty, M. D., secretary, Salt Lake City.
E. W. Browning, D. D. S.
T. J. Howells, M. D., Salt Lake City.
W. D. Donoher, M. D., Salt Lake City.
R. A. Hart, C. E., Salt Lake City.
Barnet E. Bonar, M. D., Salt Lake City.
Executive health officer:
***T. B. Beatty, M. D.**, State health commissioner, Salt Lake City.
*J. L. Jones, M. D., asst. State health commissioner and epidemiologist.
Bureau of vital statistics:
*T. B. Beatty, M. D., State registrar.
Bureau of child hygiene:
*T. B. Beatty, director.
Sanitary engineer:
*Lynn Thatcher.
Bacteriological laboratory:
*E. H. Bramhall, bacteriologist.
Appropriations for 2 years ending June 30, 1935, $10,000.
Publications issued by health department:
Biennial report.
Monthly communicable disease report.
Special bulletins.

VERMONT DEPARTMENT OF PUBLIC HEALTH

Board of health:
William G. Ricker, M. D., chairman, St. Johnsbury.
Claude M. Campbell, M. D., Manchester.
Charles G. Abell, M. D., Enosburg Falls.
Executive health officer:
***Charles F. Dalton, M. D.**, secretary, State board of health, Burlington.
Laboratory of hyiene:
*Charles F. Whitney, M. D., Burlington.
Sanitary engineering:
Earle L. Waterman, C. E., director, Burlington.
Sanitary inspector:
*Fred S. Kent, M. D., Burlington.
Division of communicable diseases:
*Fred S. Kent, M. D., Burlington.
Division of tuberculosis:
*H. W. Slocum, Burlington.
Division of poliomyelitis:
*Lillian E. Kron, R. N., Burlington.

Division of maternity and infancy:
*Nellie M. Jones, R. N.
Appropriations for fiscal year ending June 30, 1934, $44,000; 1935, $52,000.
Other sources of revenue:
Private donations for study and treatment of infantile paralysis.
Publications issued by health department:
Biennial report.

VIRGIN ISLANDS DEPARTMENT OF HEALTH

Executive health officer:
*Knud Knud-Hansen, M. D., commissioner of public health, St. Thomas.

VIRGINIA DEPARTMENT OF HEALTH

Board of health:
W. T. Graham, M. D., president, Richmond.
Mrs. Franklin H. Kenworthy, Purcellville.
Frank Darling, Hampton.
J. A. McGuire, M. D., Norton.
George B. Lawson, M. D., Roanoke.
Guy R. Harrison, D. D. S., Richmond.
L. T. Royster, M. D., University.
Executive health officer:
*I. C. Riggin, M. D., State health commissioner, Richmond.
Assistant health officer:
*Roy K. Flannagan, M. D., Richmond.
Director of rural health work and tuberculosis out-patient service:
*E. L. McQuade, M. D., D. P. H., Richmond.
Epidemiologist:
*G. F. McGinnes, M. D., Richmond.
Director of child health:
*B. B. Bagby, M. D., Richmond.
Registrar of vital statistics:
*W. A. Plecker, M. D., Richmond.
Director of public-health nursing:
*Mary I. Mastin, R. N., Richmond.
Director of mouth hygiene:
*N. T. Ballou, D. D. S., Richmond.
Bacteriologist:
*Adah Corpening, Richmond.
Chief sanitary engineer:
*Richard Messer, C. E., Richmond.
Appropriations (subject to salary reduction of 10 percent, and general appropriation reduction of 5 percent), for the fiscal year ending June 30, 1935:

Administration	$22,710
Sanitary engineering	19,450
Publicity	7,245
Town sanitation	4,075
Social hygiene	1,545
Prevention of tuberculosis	45,000
Control of epidemics	16,875
Laboratories	18,470
Promotion of child health	41,050
Rural health work	103,475
Shellfish inspection sanitation	15,000
Vital statistics	20,110
Orthopedic treatment	21,250
Collection and publication of marriage and divorce statistics	3,845
Prevention of blindness	2,200
Tuberculosis sanatoria	355,377
State aid to local tuberculosis sanatoria	34,000
Total	744,637

Publications issued by health department:
Monthly bulletin.
Annual report.

WASHINGTON STATE DEPARTMENT OF HEALTH

Board of health:
E. R. Coffey, M. D., director of health, chairman, Seattle.
Ralph Hendricks, M. D., Spokane.
Alexander Peacock, M. D., Seattle.
H. E. Wight, D. D. S., Yakima.
E. N. Hutchinson, D. V. M., Olympia.
Department of health:
*E. R. Coffey, M. D., director, Seattle.
Division of laboratories and epidemiology:
*A. U. Simpson, M. D., epidemiologist, Seattle.
Division of public health engineering:
*Roy M. Harris, public health engineer, Seattle.
Division of maternal and child hygiene and public health nursing:
*Albert McCown, M. D., Seattle.
*Mrs. Mary Louise Allen, R. N., Seattle.
Division of vital statistics:
*Francis D. Rhoads, State registrar, Seattle.
Appropriation for 2 years ending March 31, 1935:

Salaries	$48,787
Operation	29,250
State aid to local tuberculosis sanatoria	850,000

WEST VIRGINIA DEPARTMENT OF HEALTH

Public health council:
A. H. Hoge, M. D., Bluefield.
S. W. Price, M. D., Scarbro.
W. C. D. McCuskey, M. D., Wheeling.
W. E. Vest, M. D., Huntington.
B. W. Swint, M. D., Charleston.
M. T. Morrison, M. D., Sutton.
W. E. Minghini, D. D. S., Martinsburg.
Arthur E. McClue, M. D., commissioner of health, Charleston.
Executive health officer:
*Arthur E. McClue, M. D., commissioner of health, Charleston.
Division of sanitary engineering:
*Ellis S. Tisdale, chief engineer, Charleston.
*John B. Harrington, B. E., assistant engineer, Charleston.
*A. J. Kranaskas, C. E., assistant engineer, Charleston.
Division of vital statistics:
*John F. Cadden, M. D., director, Charleston.
Division of child hygiene:
*A. M. Price, M. D., acting director, Charleston.
State advisory nurse:
*Mrs. Mary Keith Cauthorne, R. N., Charleston.
Division of preventable diseases:
*Arthur E. McClue, M. D., acting director, Charleston.
Bureau of venereal diseases:
*Mrs. Ada C. McDermott, associate director, Charleston.
Division of rural sanitation:
*A. M. Price, M. D., director, Charleston.
Hygienic laboratory:
*Miss Katharine Cox, director, Charleston.
*Margaret K. Riffe, technician, Charleston.
*J. Roy Monroe, technician, Charleston.
*Mark C. Harp, technician, Charleston.
Bureau of public health education:
*Dorothea Campbell, director, Charleston.
Appropriation for fiscal year ending June 30, 1935:

For general use	$100,000
Fees (if collected)	7,500
Salary of commissioner	3,600
Total	111,100

Other sources of revenue:
Expenses of cooperative rural health work with the Rockefeller Foundation.
Publications issued:
Annual report.
Quarterly bulletin.

WISCONSIN STATE BOARD OF HEALTH

Board of health:
Stephen Cahana, M. D., president, Milwaukee.
Joseph Dean, M. D., vice president, Madison.
G. Windesheim, M. D., Kenosha.
J. J. Seelman, M. D., Milwaukee.
Mina B. Glasier, M. D., Bloomington.
H. H. Ainsworth, M. D., Birchwood.
C. A. Harper, M. D., State health officer, Madison.
Executive health officer:
*C. A. Harper, M. D., State health officer, Madison.
Assistant State health officer:
*G. W. Henika, M. D., Madison.

Deputy State health officers:
*W. J. Miller, M. D., Madison.
*G. E. Hoyt, M. D., Milwaukee.
*V. A. Gudex, M. D., Oshkosh.
*F. P. Daly, M. D., Chippewa Falls.
*R. L. Frisbie, M. D., Rhinelander.
Bureau of vital statistics.
*C. A. Harper, M. D., State registrar, Madison.
*L. W. Hutchcroft, statistician, Madison.
Bureau of communicable diseases:
*H. M. Guilford, M. D., director, Madison.
Bureau of sanitary engineering:
*L. F. Warrick, State sanitary engineer, Madison.
*O. J. Muegge, assistant sanitary engineer, Madison.
*E. J. Beatty, assistant sanitary engineer, Madison.
*J. M. Holderby, assistant sanitary engineer, Madison.
*E. J. Tully, chemical engineer, Madison.
Bureau of education:
*John Culnan, director, Madison.
Bureau of child welfare:
*Charlotte Calvert, M. D., director, Madison.
*Frances Cline, M. D., child-health physician, Madison.
*Margaret Nelson, M. D., child-health physician, Madison.
*Elizabeth Taylor, M. D., child-health physician, Madison.
*Helen Thayer, organizer of infant hygiene courses, Madison.
Bureau of public-health nursing:
*Cornelia Van Kooy, R. N., director, Madison.
*Martha Jenny, R. N., field advisory nurse, Madison.
*Maude Tollefson, R. N., advisory public-health nurse.
Bureau of nursing education:
*Barbara A. Thompson, R. N., director, Madison.
Bureau of plumbing and domestic sanitary engineering:
*Frank R. King, State domestic sanitary engineer, Madison.
Bureau of social hygiene:
*H. M. Guilford, M. D., director, Madison.
*Aimee Zillmer, lecturer, Madison.
*D. M. Warner, lecturer, Madison.
Laboratory service:
*W. D. Stovall, M. D., director, State laboratories, Madison.
*M. S. Nichols, chemist, State laboratory, Madison.
*Anna Brandsmark, director, branch laboratory, Rhinelander.
*Mildred Englebert, director, cooperative laboratory, Beloit.

Laboratory service - Continued.
*Marjorie Bates, director, cooperative laboratory, Oshkosh.
*Henry Miller, director, cooperative laboratory, Kenosha.
*Josephine Foote, director, cooperative laboratory, Wausau.
*Martha Thompson, director, cooperative laboratory, Superior.
*Clarissa McFetridge, director, cooperative laboratory, Green Bay.
*Elizabeth Mathewson, director, cooperative laboratory, Sheboygan.
Appropriations for each of fiscal years ending June 30, 1934 and 1935:

General administration	$135,000
Licensing:	
Embalmers	5,000
Hotels and restaurants	27,000
Barbers	15,000
Plumbers	16,000
Beauty parlors	15,000
Nurses	16,000
(All moneys received as license fees revert directly to the State general fund and the above amounts are appropriated for the various departments' use in each field.)	
Bureau of child welfare and public health nursing	43,350
Enforcement of medical practices act	2,500
Total	274,850

Publications issued by health department:
Quarterly bulletin.
Biennial report.
Other bulletins on communicable diseases.

WYOMING DEPARTMENT OF PUBLIC HEALTH

Board of health:
Earl Whedon, M. D., president, Sheridan.
B. V. McDermott, M. D., vice president, Superior.
W. H. Hassed, M. D., secretary and executive officer, Cheyenne.
Evald Olson, M. D., Meeteetse.
E. W. DeKay, M. D., Laramie, Wyo.
Executive health officer:
*W. H. Hassed, M. D., State health officer, Cheyenne.
Appropriations for biennial period enging Mar. 31, 1935:

State board of health	$9,000
Salary of secretary	8,000
Maternal and infant welfare	5,000
Bureau of vital statistics	2,800
Total	24,800

DEATHS DURING WEEK ENDED FEB. 9, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Feb. 9, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	9,426	8,786
Deaths per 1,000 population, annual basis	13.1	12.2
Deaths under 1 year of age	645	574
Deaths under 1 year of age per 1,000 estimated live births	59	53
Deaths per 1,000 population, annual basis, first 6 weeks of year	13.1	12.5
Data from industrial insurance companies:		
Policies in force	67,235,778	67,489,817
Number of death claims	13,845	13,811
Death claims per 1,000 policies in force, annual rate	10.7	10.7
Deaths claims per 1,000 policies, first 6 weeks of year, annual rate	11.0	11.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Feb. 16, 1935, and Feb. 17, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 16, 1935, and Feb. 17, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 16, 1935	Week ended Feb. 17, 1934	Week ended Feb. 16, 1935	Week ended Feb. 17, 1934	Week ended Feb. 16, 1935	Week ended Feb. 17, 1934	Week ended Feb. 16, 1935	Week ended Feb. 17, 1934
New England States:								
Maine	1	2	9	3	340	4	0	0
New Hampshire			---	---	16	174	0	0
Vermont		1	---	---	3	45	0	0
Massachusetts	11	7	---	---	549	2,386	0	3
Rhode Island	1	3	2	---	17	2	0	0
Connecticut	1	3	21	3	620	39	0	0
Middle Atlantic States:								
New York	42	47	[1] 24	[1] 23	1,391	804	3	4
New Jersey	11	20	17	21	407	382	3	1
Pennsylvania	52	45	---	---	3,004	1,056	4	3
East North Central States:								
Ohio	95	42	255	131	912	436	13	2
Indiana	35	20	113	57	562	450	5	0
Illinois	60	38	67	40	2,509	512	9	6
Michigan	9	15	31	3	805	44	4	2
Wisconsin	3	10	120	98	1,458	1,164	3	2
West North Central States:								
Minnesota	2	9	45	3	1,884	229	1	1
Iowa	10	7	87	13	1,462	78	3	2
Missouri	43	59	703	288	745	1,778	12	3
North Dakota	3	7	23	---	133	46	0	1
South Dakota		1	---	---	41	159	0	1
Nebraska	11	4	---	22	301	109	5	0
Kansas	---	27	40	10	1,300	121	6	3
South Atlantic States:								
Delaware	1	2	1	2	1	143	0	0
Maryland [2]	8	8	113	45	54	342	2	0
District of Columbia	9	5	1	5	7	413	3	0
Virginia	20	25	---	---	913	725	5	1
West Virginia	24	13	401	33	437	18	3	0
North Carolina [4]	23	25	210	75	653	3,040	2	2
South Carolina [3]	5	7	797	841	54	406	0	0
Georgia [3]	10	24	481	229	---	1,515	0	0
Florida [3]	20	2	92	2	48	123	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 16, 1935, and Feb. 17, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 16, 1935	Week ended Feb. 17, 1934	Week ended Feb. 16, 1935	Week ended Feb. 17, 1934	Week ended Feb. 16, 1935	Week ended Feb. 17, 1934	Week ended Feb. 16, 1935	Week ended Feb. 17, 1934
East South Central States:								
Kentucky	14	25	99	67	679	265	2	1
Tennessee	16	16	515	183	67	901	11	1
Alabama	16	16	1,862	186	766	525	2	1
Mississippi [2]	8	8					3	0
West South Central States:								
Arkansas	3	4	80	67	22	765	2	2
Louisiana	41	16	24	11	94	113	0	1
Oklahoma [4]	13	15	437	121	84	449	5	0
Texas [3]	41	197	981	1,076	202	1,816	6	3
Mountain States:								
Montana		2	311	49	135	16	3	0
Idaho	2				68	19	0	0
Wyoming [5]					16	56	0	0
Colorado	10	7	3		600	63	0	0
New Mexico	7	3	25	9	14	105	0	0
Arizona		6	81	15	17	21	0	2
Utah [2]					7	815	0	0
Pacific States:								
Washington		6	41	3	349	268	3	0
Oregon	2	4	173	49	102	19	0	0
California	56	50	306	39	530	1,310	8	3
Total	739	862	8,591	3,825	24,477	21,125	131	57

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 16, 1935	Week ended Feb. 17, 1934	Week ended Feb. 16, 1935	Week ended Feb. 17, 1934	Week ended Feb. 16, 1935	Week ended Feb. 17, 1934	Week ended Feb. 16, 1935	Week ended Feb. 17, 1934
New England States:								
Maine	0	0	29	24	0	0	0	3
New Hampshire	0	0	8	33	0	0	0	0
Vermont	0	0	11	17	0	0	0	1
Massachusetts	0	0	172	251	0	0	0	3
Rhode Island	0	0	15	12	0	0	0	0
Connecticut	0	0	65	50	0	0	0	0
Middle Atlantic States:								
New York	1	1	717	694	0	0	7	4
New Jersey	0	1	154	221	0	0	1	4
Pennsylvania	1	2	666	710	0	0	12	13
East North Central States:								
Ohio	3	0	1,225	753	1	0	5	8
Indiana	0	0	254	291	3	1	3	6
Illinois	2	1	948	621	1	5	11	2
Michigan	0	1	379	517	1	4	2	3
Wisconsin	1	0	627	231	18	33	2	4
West North Central States:								
Minnesota	1	0	97	59	0	2	0	0
Iowa	1	0	97	78	4	3	1	1
Missouri	0	1	155	212	2	7	2	10
North Dakota	0	0	68	31	0	1	1	0
South Dakota	0	0	9	18	3	1	1	1
Nebraska	0	0	41	23	78	6	0	2
Kansas	0	0	110	115	9	4	0	2
South Atlantic States:								
Delaware	0	0	14	10	0	0	0	0
Maryland [2]	0	0	85	87	0	0	1	4
District of Columbia	0	1	36	14	0	0	0	0
Virginia	3	0	74	74	0	0	13	5
West Virginia	0	1	155	84	0	0	5	2
North Carolina [3]	0	1	42	51	0	0	1	2
South Carolina [3]	0	0	3	10	0	0	0	6
Georgia [3]	0	0	19	0	0	0	3	5
Florida [3]	1	0	13	1	0	0	1	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 16, 1935, and Feb. 17, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 16, 1935	Week ended Feb. 17, 1934	Week ended Feb. 16, 1935	Week ended Feb. 17, 1934	Week ended Feb. 16, 1935	Week ended Feb. 17, 1934	Week ended Feb. 16, 1935	Week ended Feb. 17, 1934
East South Central States:								
Kentucky	0	0	36	79	0	1	12	2
Tennessee	1	0	57	64	0	0	0	2
Alabama	1	1	14	20	0	2	4	2
Mississippi [4]	0	0	9	11	1	0	5	1
West South Central States:								
Arkansas	0	0	15	10	1	22	2	2
Louisiana	0	0	26	26	0	7	16	11
Oklahoma [4]	0	0	23	27	3	8	4	5
Texas [3]	0	0	74	179	111	53	29	39
Mountain States:								
Montana	0	0	9	12	1	0	0	0
Idaho	0	0	7	10	0	1	1	0
Wyoming [5]	0	0	3	6	3	1	1	0
Colorado	2	0	239	56	8	14	0	0
New Mexico	0	0	19	31	2	0	3	2
Arizona	0	0	29	22	0	0	0	0
Utah [2]	0	0	82	10	0	2	0	0
Pacific States:								
Washington	1	0	52	45	37	3	4	1
Oregon	0	0	57	38	3	1	0	1
California	13	3	254	247	9	4	4	5
Total	32	14	7,293	6,218	209	186	157	166

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Feb. 16, 1935, 12 cases, as follows: North Carolina, 1; South Carolina, 2; Georgia, 5; Florida, 1; Texas, 3.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Rocky Mountain spotted fever, week ended Feb. 16, 1935, Wyoming, 1 case.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December 1934										
Missouri	11	275	554	22	797		0	485	8	64
January 1935										
Alabama	7	75	3,120	76	687	19	3	78	12	7
Arkansas	5	52	352	10	57	22	0	27	11	11
Maine		11	22		503		1	80	0	1
Maryland	1	35	1,805	2	285		1	400	0	10
Massachusetts	4	35		1	1,246	1	2	775	0	6
Minnesota	7	41	148		5,857		6	536	31	7
Nebraska	10	36	27		862		1	285	147	6
New Jersey	2	81	707	1	469		2	525	0	10
New Mexico	9	24	624		166	1	0	93	0	14
North Carolina	9	118	1,865		3,011	14	2	232	1	13
South Carolina	3	303	6,418	180	61	47	1	36		6
Texas	9	299	1,780	979		39	7	307		103

December 1934

Missouri:	Cases
Chicken pox	476
Dysentery	13
Epidemic encephalitis	5
Mumps	129
Rabies in animals	8
Septic sore throat	52
Tularaemia	32
Undulant fever	3
Whooping cough	204

January 1935

	Cases
Actinomycosis:	
Massachusetts	2
Chicken pox:	
Alabama	475
Arkansas	69
Maine	270
Maryland	783
Massachusetts	1,899
Minnesota	679
Nebraska	340
New Jersey	1,722
New Mexico	88
North Carolina	634
South Carolina	94
Conjunctivitis:	
New Mexico	1
Dengue:	
Alabama	3
South Carolina	1
Diarrhea:	
Maryland	3
South Carolina	140
Dysentery:	
Maryland	2
Massachusetts (amoebic)	1
Minnesota (bacillary)	2
New Jersey (amoebic)	2
New Jersey (bacillary)	4
New Mexico	2
Epidemic encephalitis:	
Alabama	4
Massachusetts	1
Minnesota	3
Nebraska	1
New Jersey	2
South Carolina	4
Food poisoning:	
New Mexico	1
German measles:	
Alabama	2
Maine	173
Maryland	11
Massachusetts	810
New Jersey	105
New Mexico	253
North Carolina	47
Hookworm disease:	
South Carolina	43
Impetigo contagiosa:	
Maryland	20
Jaundice, epidemic:	
Maryland	5
Mumps:	
Alabama	75
Arkansas	37
Maine	26
Maryland	83
Massachusetts	302
Nebraska	225
New Jersey	387
New Mexico	52
South Carolina	188
Ophthalmia neonatorum:	
Maryland	1
Massachusetts	97
New Jersey	3
New Mexico	1
North Carolina	1
South Carolina	7
Paratyphoid fever:	
Arkansas	4
North Carolina	1
Texas	7
Puerperal septicemia:	
New Mexico	1
Rabies in animals:	
Alabama	165
Maryland	2
Massachusetts	28
New Jersey	7
South Carolina	69
Rocky Mountain spotted fever:	
Maryland	1
Septic sore throat:	
Maine	1
Maryland	10
Massachusetts	12
Nebraska	2
New Mexico	5
North Carolina	10
Tetanus:	
Alabama	6
Massachusetts	2
New Jersey	1
Trachoma:	
Massachusetts	1
Minnesota	1
New Jersey	1
Trichinosis:	
Massachusetts	5
New Jersey	2
Tularaemia:	
Alabama	1
Maryland	12
Minnesota	3
New Jersey	1
North Carolina	5
South Carolina	1
Typhus fever:	
Alabama	11
Maryland	2
New Jersey	1
North Carolina	4
South Carolina	2
Undulant fever:	
Maryland	2
Massachusetts	1
Minnesota	4
New Jersey	2
North Carolina	2
South Carolina	1
Vincent's infection:	
Maine	4
Maryland	8
Whooping cough:	
Alabama	172
Arkansas	42
Maine	225
Maryland	171
Massachusetts	839
Minnesota	166
Nebraska	43
New Jersey	1,406
New Mexico	96
North Carolina	1,120
South Carolina	88

CASES OF VENEREAL DISEASES REPORTED FOR DECEMBER 1934

This statement is published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State health officers. They are preliminary and are, therefore, subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama [1]				
Arizona	22	0.49	155	3.42
Arkansas [2]	208	1.59	215	1.15
California	1,160	1.91	1,245	2.05
Colorado [1]				
Connecticut	50	.30	61	.37
Delaware	140	5.81	31	1.29
District of Columbia	127	2.57	88	1.78
Florida	319	2.25	55	.35
Georgia	583	2.00	350	1.20
Idaho	0		0	
Illinois	1,242	1.59	1,053	1.35
Indiana	178	.54	72	.22
Iowa [2]	151	.61	125	.50
Kansas	100	.53	80	.42
Kentucky	177	.67	218	.83
Louisiana	156	.72	82	.38
Maine	40	.50	34	.42
Maryland	669	4.02	190	1.14
Massachusetts	383	.89	570	1.32
Michigan	546	1.08	547	1.08
Minnesota	322	1.24	289	1.11
Mississippi	932	4.55	1,549	7.57
Missouri	645	1.76	363	.99
Montana [3]	35	.65	33	.61
Nebraska	27	.19	51	.37
Nevada [1]				
New Hampshire	13	.28	12	.26
New Jersey	492	1.17	250	.60
New Mexico [3]	51	1.18	41	.94
New York	1,507	3.48	1,157	.89
North Carolina	830	2.53	235	.72
North Dakota	22	.32	38	.55
Ohio [3]	685	1.01	340	.50
Oklahoma [3]	246	1.18	155	.74
Oregon	34	.35	81	.82
Pennsylvania	261	.27	199	.20
Rhode Island	127	1.81	102	1.45
South Carolina [2]	220	1.26	353	2.02
South Dakota	5	.07	28	.40
Tennessee	1,000	4.00	582	2.18
Texas	447	.71	161	.27
Utah [1]				
Vermont	23	.64	20	.55
Virginia	380	1.59	243	1.00
Washington	207	1.20	107	1.23
West Virginia [1]				
Wisconsin [4]	114	.38	21	.07
Wyoming [1]				
Total	18,095	1.82	11,671	.98

[1] Not reporting.
[2] Incomplete.
[3] Have been reporting regularly but no report received for current month.
[4] Only cases of syphilis in the infectious stage are reported.

NOTE.—Surveys in which all medical sources have been contacted in representative communities throughout the United States have revealed that the monthly rate per 10,000 population is 6.6 for syphilis and 10.2 for gonorrhea.

WEEKLY REPORTS FROM CITIES

City reports for week ended Feb. 9, 1935

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	7	0	6	2	1	0	0	0	10	29
New Hampshire:											
Concord	0	------	0	0	1	1	0	0	0	0	13
Nashua	0	------	0	0	0	1	0	0	0	0	--------
Vermont:											
Barre	0	-----	0	0	0	0	0	0	0	7	8
Burlington	0	------	0	1	0	4	0	0	0	0	15
Massachusetts:											
Boston	3	------	0	12	47	36	0	9	2	36	280
Fall River	0	------	0	271	2	1	0	0	0	5	32
Springfield	0	------	0	33	1	5	0	1	0	5	27
Worcester	1	------	0	0	6	9	0	1	0	12	57
Rhode Island:											
Pawtucket	0	------	0	0	0	1	0	0	0	0	18
Providence	0	1	5	8	4	7	0	6	0	7	80
Connecticut:											
Bridgeport	0	2	2	5	1	13	0	2	0	1	32
Hartford	0	------	0	89	7	11	0	0	0	7	38
New Haven	0	------	0	76	3	0	0	0	0	0	49
New York:											
Buffalo	0	------	2	113	13	54	0	5	0	28	148
New York	19	38	11	250	148	331	0	97	2	204	1,670
Rochester	0	------	0	157	1	23	0	1	0	12	74
Syracuse	0	------	1	14	4	10	0	1	0	9	63
New Jersey:											
Camden	0	------	0	0	1	3	0	1	0	11	35
Newark	1	9	0	27	14	17	0	5	1	63	116
Trenton	0	------	1	36	5	8	0	4	0	0	47
Pennsylvania:											
Philadelphia	10	19	13	8	35	70	0	24	0	140	527
Pittsburgh	5	20	7	192	23	29	0	10	0	25	183
Reading	0	------	0	6	0	7	0	0	0	17	25
Scranton	1	------	--------	145	-------	5	0	-------	0	2	--------
Ohio:											
Cincinnati	10	------	5	0	13	41	0	7	0	6	145
Cleveland	8	93	4	93	21	36	0	17	0	27	216
Columbus	10	2	2	54	10	41	0	5	0	4	104
Toledo	3	3	3	43	3	15	0	5	0	8	55
Indiana:											
Fort Wayne	3	------	0	9	3	9	0	1	0	0	38
Indianapolis	5	------	3	10	21	35	0	4	0	7	--------
South Bend	0	1	1	41	2	3	0	3	0	0	25
Terre Haute	0	1	1	0	1	0	0	0	0	0	23
Illinois:											
Chicago	20	14	10	431	60	480	0	41	1	62	749
Springfield	0	4	1	1	7	13	0	1	0	7	25
Michigan:											
Detroit	5	15	0	165	39	132	0	18	1	65	307
Flint	1	------	0	86	4	11	0	1	0	8	33
Grand Rapids	0	------	2	57	5	9	0	0	0	9	50
Wisconsin:											
Kenosha	0	------	0	213	0	22	0	1	0	10	9
Milwaukee	0	1	1	265	11	267	0	3	0	38	100
Racine	0	------	0	12	1	7	0	0	0	2	15
Superior	0	------	0	29	0	1	0	0	0	1	5
Minnesota:											
Duluth	0	------	1	247	6	1	0	0	0	0	38
Minneapolis	2	------	3	1,717	5	20	0	1	0	9	118
St. Paul	1	1	1	5	8	12	0	2	0	14	60
Iowa:											
Davenport	1	------	--------	4	-------	1	0	-------	0	0	--------
Des Moines	2	------	--------	40	-------	7	0	-------	0	0	31
Sioux City	0	------	--------	6	-------	2	0	-------	0	2	--------
Waterloo	1	------	--------	8	-------	9	0	-------	0	1	--------
Missouri:											
Kansas City	1	------	0	81	16	27	0	5	0	0	112
St. Joseph	4	------	0	15	1	4	0	0	0	0	10
St. Louis	17	3	3	9	11	33	0	9	0	11	241

City reports for week ended Feb. 9, 1935—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
North Dakota											
Fargo	0		0	0	0	3	0	0	1	1	5
Grand Forks	0			3		3	0		0	0	--
South Dakota											
Aberdeen	0			[illegible]		1	0		0	2	
Sioux Falls	0			0		0	0		0	0	7
Nebraska											
Omaha			2	16	12	22	0	5	0	0	69
Kansas											
Topeka	0		0	6	2	3	0	1	0	3	7
Wichita	2	1	0	110	5	5	0	0	0	7	26
Delaware											
Wilmington	4		0	0	6	3	0	1	0	0	25
Maryland											
Baltimore	2	10	4	20	30	46	0	17	0	17	267
Cumberland	0		0	12	0	2	0	0	0	0	13
Frederick	1		0	0	0	0	0	0	0	0	4
District of Columbia											
Washington	18	7	1	11	18	25	0	12	2	2	156
Virginia											
Lynchburg	0		0	212	1	3	0	0	0	3	15
Norfolk	[illegible]	11	0	3	2	4	0	4	0	11	41
Richmond	2		3	[illegible]	9	13	0	4	0	0	58
Roanoke	0		1	7	3	4	0	1	0	0	19
West Virginia											
Charleston	0	1	0	28	7	2	0	1	0	3	28
Huntington	0			6		1	0		0	0	
Wheeling	0		0	13	2	26	0	2	0	3	21
North Carolina											
Raleigh											
Wilmington	0		1	0	2	0	0	1	0	2	19
Winston-Salem	2	2	2	0	1	4	0	0	0	35	16
South Carolina											
Charleston	1	71	0	0	6	5	0	1	0	1	29
Columbia	0		0	0	7	0	0	1	0	0	22
Greenville	1		0	0	1	0	0	0	0	7	4
Georgia											
Atlanta	2	13	5	1	11	10	0	6	0	6	75
Brunswick											
Savannah	0	71	4	0	3	3	0	2	1	0	49
Florida											
Miami	2	3	0	0	1	1	0	3	0	0	48
Tampa	3	3	3	0	3	2	0	1	0	0	33
Kentucky											
Ashland	0	8		0		3	0		1	0	-
Lexington	0	7	0	25	3	1	0		0	5	23
Tennessee											
Memphis	1		4	1	12	6	0	4	0	2	94
Nashville	1		0	0	2	2	0	0	0	3	45
Alabama											
Birmingham	0	53	1	17	1	6	0	2	0	9	54
Mobile	1	1	2	0	[illegible]	0	0	0	0	0	31
Montgomery	2	3		0		3	0	--	0	0	--
Arkansas											
Fort Smith											--
Little Rock	0		0	1	9	2	0	1	0	0	11
Louisiana											
New Orleans	[illegible]	4	2	6	16	8	0	10	1	0	197
Shreveport	1		0	32	6	2	0	1	0	2	22
Texas											
Dallas	3	3	2	0	15	4	0	1	0	1	75
Fort Worth	0		2	0	14	8	0	2	1	0	47
Galveston	3		0	0	3	0	0	2	0	0	26
Houston	0		3	0	9	0	0	2	0	0	91
San Antonio	0		6	0	9	1	0	8	0	0	77
Montana											
Billings	2		0	9	0	1	0	0	0	0	2
Great Falls	0		0	230	3	0	0	0	0	0	9
Helena	0		0	76	1	0	0	0	0	3	7
Missoula	0		0	31	0	3	0	0	0	6	3
Idaho											
Boise	0	0	0	0	0	0	0	0	0	0	6
Colorado											
Denver	3		7	314	16	213	0	6	0	4	125
Pueblo	0		0	30	2	5	0	0	0	1	15

City reports for week ended Feb. 9, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Utah:											
Salt Lake City	0	------	0	8	5	62	0	1	0	38	40
Nevada:											
Reno	0	------	0	0	0	0	0	0	0	0	5
Washington:											
Seattle	0	------	------	20	------	14	14	------	0	1	------
Spokane	0	------	0	100	0	11	0	1	0	1	33
Tacoma	0	------	1	0	3	2	4	1	0	0	30
Oregon:											
Portland	0	3	0	35	5	13	0	1	0	0	69
Salem	0	2	------	0	------	1	0	------	0	0	------
California:											
Los Angeles	31	213	5	13	24	40	3	13	2	2	384
Sacramento	2	1	2	4	0	3	0	3	0	2	32
San Francisco	0	23	1	9	15	24	0	10	1	5	209

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts:			
Fall River	1	0	0
New York:			
New York	3	2	2
Pennsylvania:			
Philadelphia	1	0	0
Pittsburgh	0	1	0
Ohio:			
Cincinnati	6	1	0
Cleveland	1	2	0
Columbus	1	0	0
Toledo	1	0	0
Indiana:			
Indianapolis	1	0	0
South Bend	1	1	0
Illinois:			
Chicago	9	2	1
Springfield	2	0	0
Michigan:			
Detroit	2	1	0
Minnesota:			
Minneapolis	1	0	0
Iowa:			
Des Moines	1	0	0
Missouri:			
St. Joseph	5	0	0
St. Louis	6	1	0
Nebraska:			
Omaha	2	1	0
Maryland:			
Baltimore	3	0	0
District of Columbia:			
Washington	2	2	0
Virginia:			
Richmond	0	2	0
West Virginia:			
Charleston	1	1	0
Huntington	1	0	0
South Carolina:			
Charleston	1	1	0
Kentucky:			
Lexington	1	1	0
Tennessee:			
Memphis	4	2	0
Nashville	2	0	0
Arkansas:			
Little Rock	1	1	0
Louisiana:			
New Orleans	0	0	1
Texas:			
Fort Worth	3	0	0
Colorado:			
Denver	0	1	0
Washington:			
Seattle	2	0	0
Tacoma	0	0	1
California:			
Los Angeles	0	0	2
San Francisco	0	1	0

Pellagra.—Cases: Savannah, 2; Montgomery, 1; New Orleans, 1; Dallas, 1; Los Angeles, 1.
Typhus fever.—Cases: New York, 1; Atlanta, 1; Savannah, 2; Tampa, 1; Dallas, 1.

FOREIGN AND INSULAR

CHILE

Typhus fever—Years 1932, 1933, and 1934.—The following numbers of cases of typhus fever and deaths from the same cause have been reported in the Provinces of Chile for the years 1932, 1933, and 1934. The Provinces are listed according to geographical position from north to south along the Pacific coast:

Province	1932		1933		1934	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Tarapaca	2		3		68	17
Antofagasta	6		108	33	4	2
Atacama	2		2	1		
Coquimbo	1		51	14	4	1
Aconcagua			201	43	301	50
Santiago	36	6	8,137	2,132	7,015	1,812
O'Higgins					162	39
Colchagua	11	9	502	115	64	15
Talca	3	1	235	44	440	81
Maule	2	2	259	56	695	114
Nuble	179	15	1,037	157	1,034	156
Concepcion	226	44	2,571	478	1,700	314
Arauco					695	106
Bio-Bio	47	5	800	181	1,199	272
Cautin	234	23	1,173	280	842	217
Valdivia	3	1	63	8	161	34
Chiloe	2	2	144	17	286	35
Aysen						
Magallanes					1	
Total	754	108	15,370	3,559	14,671	3,265

PANAMA CANAL ZONE

Communicable diseases—October–December 1934.—During the months of October, November, and December 1934, certain communicable diseases, including imported cases, were reported in the Panama Canal Zone and terminal cities as follows:

Disease	October		November		December	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chicken pox	19		7		5	
Diphtheria	9		7	1	18	1
Dysentery (amoebic)	20		26		31	
Dysentery (bacillary)	2					1
Malaria	92	5	100	2	106	5
Measles			1			
Mumps					3	
Paratyphoid fever	1					
Pneumonia		24		30		25
Poliomyelitis					1	
Relapsing fever			1			
Tuberculosis		20		22		23
Typhoid fever	2		4	1	4	
Whooping cough	11		8		3	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Feb. 22, 1935, pp. 267-279. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Mar. 29, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Yellow Fever

Gold Coast—Wenchi.—On November 15, 1934, one case of yellow fever was reported in Wenchi, Gold Coast.

Nigeria—Quellam Maduri.—On January 23, 1935, one suspected case of yellow fever was reported at Quellam Maduri, Nigeria.

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UNITED STATES TREASURY DEPARTMENT

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PUBLIC HEALTH REPORTS

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THE OCCURRENCE OF INFESTATIONS WITH *E. HISTOLYTICA* ASSOCIATED WITH WATER-BORNE EPIDEMIC DISEASES [1]

By A. V. HARDY, M. D., *Consultant*, and BERTHA KAPLAN SPECTOR, Ph. D., *Associate Protozoologist, United States Public Health Service*

PURPOSE OF THE STUDY

In the study of the epidemic of amoebic dysentery which originated in Chicago in 1933, it became increasingly evident, as has been pointed out by Bundesen (*1*), that the infection was probably spread through water. The one obstacle in the way of accepting this conclusion with confidence was the absence of similar outbreaks in previous rather comparable circumstances. It is well known that in numerous instances heavy and direct sewage pollution of water has occurred. These have given rise to epidemics of acute enteritis and typhoid fever, but, so far as we have been able to learn, to no recognized amoebic dysentery. Carriers of *E. histolytica*, however, have been found to be widely distributed and relatively numerous. According to Craig (*2*), in 49,336 persons examined in 18 different surveys in the United States the average number found to be positive for this parasite was 11.6 percent. Other studies in foreign countries have revealed an even greater proportion of carriers. Hence, any feces-polluted water would be expected to contain cysts of *E. histolytica*. Furthermore, amoebic dysentery has a rather characteristic clinical picture, and it is reasonable to expect that a portion of the cases would be recognized, particularly if the disease were prevalent. Hitherto these considerations made it difficult to explain the absence of recognized amoebic dysentery in association with water-borne epidemic diseases. Therefore, a study of infestations with *E. histolytica* in such situations seemed to be needed.

[1] The observations on which this paper is based were made under the auspices of (1) the United States Public Health Service, (2) the board of health, the division of water purification, and the fire department of the city of Chicago, (3) the department of preventive medicine of the State University of Iowa, and (4) the department of medicine and the Douglas Smith Foundation of the University of Chicago.

An unfortunate series of accidents and combination of circumstances gave an unexpectedly early opportunity for such a study. Following an extensive fire in Chicago in May 1934, cases of acute diarrhea were soon reported. In due time typhoid fever made its appearance. Firemen and spectators were both affected. It proved the most extensive epidemic of typhoid fever from which Chicago has suffered in many years. Suspecting that amoebic dysentery might also be found, and appreciating the importance of its early and definite recognition, a survey of those exposed was undertaken, both as a practical public-health measure and to throw light on unanswered questions concerning amoebic infection.

For the major part of the study our attention was limited to members of the Chicago Fire Department. The active cooperation of the administrative officers, notably Dr. H. P. Sullivan, physician to the department, was generously given. The men were sent to us under official orders and were directed to follow our instructions. This situation greatly facilitated the study. Supplementary data were also collected from spectators who developed illness shortly after the fire.

CIRCUMSTANCES ACCOUNTING FOR THE EPIDEMIC

On May 19, 1934, at about 4:20 p. m., a fire started in the cattle pens of the Union Stockyards Co. Owing to the wooden structure of the pens, to the large amount of inflammable hay and straw, and to moderately strong winds, the flames spread rapidly. It was reported that the fire traveled through the pens nearly as fast as a man could run. During the following hours the fire spread through approximately two-thirds of the cattle pens and to surrounding business houses. The spectacular nature of the fire and the dramatic reports of it over the radio brought eyewitnesses to the scene by the thousands. These viewed the fire from the roofs of surrounding buildings and from the tops of freight cars, and large numbers flocked into the area of the burned stock pens and through the unburned pens to the windward of the fire. No accurate estimate of the number of spectators may be given, but all observers agree that for each fireman there were many idle viewers of the scene.

As the origin of the fire was wholly within the stock pens, the first fire companies reported for duty in that region. The majority of those which were called by later alarms worked on the adjoining business houses, which became involved quite early. The estimated number of firemen on duty was 1,600, of whom a substantial majority worked entirely outside of the stockyards.

Owing to illnesses which developed, a careful study of the water system in this area was later undertaken. It was found that the area of the Union Stockyards had a double water supply. For reasons of economy, a private supply was more generally available than the

city supply. The former was distributed to all the stock watering troughs. Each small pen had its individual trough, and this was supplied by a small pipe which emptied from a height of 4 to 5 feet. There were, therefore, scores of these accessible drinking places in the yards. For fire-fighting purposes there were also special high-pressure mains drawing from the private supply. This private system obtained its water from two sources. One was from an open reservoir, occupying approximately the area of a city block, and commonly known as "Haydens Lake." Water was being supplied to this at the time of the fire largely, or entirely, from city mains. Ordinarily it was pumped from a deep well, but a few days preceding the fire the pump had been removed for repairs. For emergencies, another source was available. Water could be drawn from the nearby large sewer, which in earlier years was an open stream known as "Bubbly Creek." Under normal circumstances this supply was filtered and chlorinated. On the day of the fire, however, chlorination was not carried out (for a portion of the time at least), and in the emergency, filtration could not be conducted in an efficient manner. The call was for water to fight an apparently uncontrollable fire, and at the time this was the one important consideration. Furthermore, the officials of the stockyards company believed that water from the sewer could be distributed only through the high pressure fire-fighting mains. However, open cross-connections between this and the stock-watering lines were later found. It was evident, therefore, that a substantial amount of this heavily polluted water from the sewer would pass from the high-pressure fire lines to the low-pressure pipes running to the stock-watering troughs.

We have questioned carefully the firemen who became ill and also several civilian spectators. All were in agreement that the water running to the stock troughs was used freely for drinking purposes. Several persons have mentioned that to get a drink it was necessary to stand in line, even though the open pipes were distributed every few yards. The firemen were rarely able to describe accurately the source of their drinking water. Those working in "the pens" area commonly used water from the above-described pipes emptying into the troughs. Many went directly to a hydrant, while others used a drinking pipe especially supplied on each of the fire engines. This delivered the same water as was then being used for fire-fighting purposes. Helpful civilians also carried water. The source of this was rarely known, but occasionally the men stated that the pails were filled from pipes emptying into the watering troughs.

With the exception of a few companies in the immediate vicinity of the yards, few firemen seemed to appreciate that there was this double water supply and that only one was safe for human consumption. Civilians appeared to believe that any water running out of a

pipe was city water and good to drink. Only regular employees of the stockyards company and a few firemen were sufficiently informed to take proper precautions relative to drinking water. After the conflagration was under control, appropriate warnings were posted cautioning against the drinking of this water, but by that time most of the damage had been done.

THE TYPHOID FEVER EPIDEMIC

During 1933 there were reported to the Chicago Board of Health 78 cases of typhoid fever with 12 deaths. A substantial proportion of these were contracted very definitely outside of Chicago. In 1934, in the epidemic related to the stockyards fire, there occurred 69 cases and 11 deaths. There were in addition, 2 cases of paratyphoid fever contracted apparently from the same source.

The epidemic was typical of its kind. The incubation periods were the expected 10 days to 3 weeks. Reports came to the board of health after the usual delay. The first official reports were received on June 8, but it was a full month after the fire before there was any definite evidence that an epidemic was in progress. In regard to the virulence of the infection the epidemic did seem exceptional in that the normal death expectancy was somewhat exceeded. Clinically, also, the severity of the symptoms appeared to be beyond the average. About one-half of these patients had an acute diarrhea which began shortly after the fire. In some cases this subsided before the onset of the typhoid fever, in others the two conditions blended. Except in the prodromal phase of the typhoid infections there was never any difficulty in differentiating clinically between the typhoid fever and the enteritis.

Three of the typhoid cases were among firemen and the remainder were among civilian spectators. We suspect this corresponds in general to the proportions of firemen and spectators at the fire.

THE DYSENTERY EPIDEMIC AND THE STUDY OF IT

On the third and fourth days after the fire the Chicago papers carried brief reports concerning acute enteritis occurring among firemen. This was the first suggestion that there might have been any serious health hazard at the time of the fire. The situation was investigated by a representative of the Chicago Board of Health, and the illnesses were first attributed to a simple sewage poisoning. During the second week, however, further reports were received by the board of health of quite severe and persisting illnesses. That amoebic dysentery might be occurring seemed a distinct possibility. Hence a special study of the situation was undertaken.

The fire marshal first called for reports of all illnesses which had occurred among firemen following the stockyards fire. When all

these had been received it was found that over 300 men in 76 different companies scattered widely throughout Chicago had been or were still affected. At various company stations and in the hospitals many of these men were interviewed. Later, others were directed to come at a specified time to the office of the physician to the fire department, or to the laboratory. During these interviews we (A. V. H., assisted by T. Schmid, of the division of water purification, city of Chicago) obtained both clinical and epidemiological data. Stool specimens were collected at that time, or arrangements were made for this examination at a later date. Thus almost all of the firemen who had been ill were examined. In a similar way an adequate number of controls were studied. Concurrently, also, all cases of dysentery officially reported to the board of health were individually examined with a view to determining whether they possibly had an identical origin.

CLINICAL FINDINGS IN FIREMEN

The histories obtained from the men revealed that the illnesses varied from transient ailments to relatively severe and prolonged sickness. It seemed essential, therefore, that the cases be grouped according to the severity of the illness. The division was made on the basis of the variety, severity, and duration of symptoms, and entirely independent of laboratory findings. In the borderline cases between the groups, decisions were somewhat uncertain, but in the majority of instances any given case clearly belonged in one of the three groups described below.

There were 35 mild cases. Onset occurred commonly between 24 and 48 hours after exposure. In 1 case it was later than 72 hours. Diarrhea was the outstanding symptom, and in many, the only one. A mild nausea and occasional vomiting occurred in a small number. Abdominal cramps or prolonged weakness were rarely mentioned. Stools were usually watery. In 5 instances mucus was reported, but in no instance was blood noted. The total duration of illness varied from a few hours to less than 3 days.

Forty-nine cases were classified as illnesses of moderate severity. Three reported that symptoms began on the day of the fire. The usual onset, however, was between 24 and 36 hours following exposure. In one instance the illness began after 6 days. The onset tended to be sudden, with rather severe symptoms. In this group also, diarrhea was the one constant complaint. It was accompanied by abdominal cramps in almost one-half of the cases. Nausea occurred in one-third and vomiting in somewhat less. Moderate weakness was troublesome to several of the patients. A definite loss of weight (averaging 6 pounds per man) was noted in 8. A short recurrence occurred in four. Three men believed that they had had fever, and 5 stated

that there had been "slime" in the stool. The usual duration of these cases was from 3 to 4 days, with limits of 2 and 7 days.

One hundred and fifty-eight (two-thirds) of the cases were regarded as severe infections. The time of onset was distributed from less than 24 hours (1 case) to more than 1 week after the fire (3 cases). Again, however, the common incubation period was 24 to 72 hours. In this group the symptoms tended to be more severe, more prolonged, and more varied The diarrhea was often violent. Incontinence of feces was not uncommon. Nausea was experienced by one-half and vomiting by slightly less than one-third. Early in the illness defecation and vomiting were often simultaneous. Relatively severe cramps and marked weakness were noted by two-thirds. A known fever or feverishness was reported by 10 percent. A loss of weight, varying from 5 to 30 pounds and averaging 12, was reported by almost one-half. In this group the characteristic stool was again "nothing but water", but 38 (24 percent) reported mucus, and 18 (11 percent) reported blood.

The most striking feature, and the most puzzling, was the frequency of recurrences. The usual story was that diarrhea would occur "off and on," but with each recurring attack it would be less prolonged and less severe. In many instances the men voluntarily stated that while they were no longer troubled with acute diarrhea, still their stools "had not been normal since the fire." A softness of the movement and an abundance of gas were characteristic. Few were ill enough to be off duty for long periods, but complaints persisted for a disturbing length of time. In approximately one-third of this group the duration was 1 month or more. In many, the illness continued until specific treatment was undertaken. At the time of the last survey, 2 months after the fire, 12 untreated cases still had troublesome complaints.

The treatment of these infections at first was symptomatic and nonspecific. Marked improvement to complete cure often seemed to follow the early use of castor oil. Illnesses of 1 week or more in duration did not commonly yield to such medication. In view of the high percentage of positive findings for *E. histolytica*, as hereafter reported, it was deemed desirable to test the efficacy of some specific amoebicide, and carbarsone was selected. Ordinarily, 2 capsules of 0.25 gram each were given 3 times a day for 5 days. In earlier cases the dosage was smaller and more prolonged. Almost without exception there was prompt response to this therapy. We repeatedly heard of firemen who insisted upon obtaining this medication because of its beneficial effect on some companion.

Throughout the study we were looking for amoebic dysentery, but classical cases among the firemen were not encountered. In several, however, this seemed to be the best diagnosis which could be made.

An early case was reported to the board of health as amoebic dysentery and was counted as such. Similar infections encountered later were regarded as suspects only. The early onset and course was not that of amoebic dysentery, but later clinical and laboratory findings demanded its consideration. While recognizing that no final and certain judgment can be given, still we are inclined to believe that *E. histolytica* was the important etiological agent in the group with the severer infections. To support this there is the following:

1. *E. histolytica* were found in almost two-thirds, on one stool examination only.
2. Bacteriological studies failed to reveal other etiological agents.
3. Treatment with a specific amoebicide was remarkably effective.
4. The late symptoms and course of the illnesses were quite characteristic of amoebic infections.

For these reasons we suspect that the firemen suffered from two conditions. The early illness we would attribute to nonspecific organisms or toxic products in the heavily polluted water. In general, we believe that the late symptoms can be explained satisfactorily by the *E. histolytica* invasion.

LABORATORY FINDINGS IN FIREMEN

Throughout, the laboratory studies were made by one of us (B. K. S.). The diagnoses were usually made from the routine water and iodine preparations. If the nature of the organism seemed doubtful, cultures were also used. In a few cases decisions were made only after one, two, or more repeat samples were obtained. With these exceptions only one stool specimen was ordinarily examined from each man.

The findings are presented in table 1.

TABLE 1. *Stool findings for E. histolytica in Chicago firemen*

Group	Totals					Laboratory findings							
	Examined	Negative		Positive		Small cysts		Large cysts		Procysts		Trophozoites	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Controls	161	136	84.5	25	15.5	22	13.7	5	3.1	4	2.5	0	0
Possibly exposed, illness denied	34	28	82.0	6	18.0	6	18.0	0	0	3	9.0	0	0
Mild illness	33	19	57.6	14	42.4	13	39.4	2	6.1	1	3.0	0	0
Moderate illness	43	21	48.8	22	51.2	20	46.5	6	14.0	4	9.3	1	2.3
Severe illness	140	53	37.9	87	62.1	65	46.4	34	24.3	24	17.2	4	2.9

To the three clinical groups previously described, two others were added. The controls were firemen who were not at the fire. None of those reporting for examination had had any recent intestinal

disorder. The "possibly exposed, illness denied" group were men who were at the fire, who had had some illness following it, but with symptoms not definitely related to the gastro-intestinal tract. Several of these men gave clear histories which made it certain that they had had no contact with the polluted water. In others, however, both the source of the water which they drank and the nature of their illnesses was somewhat uncertain.

The high percentage of positives among the normal controls warrants critical consideration. That the findings here given may represent a Chicago normal was suggested by an unreported survey of healthy family groups, which was conducted immediately following the study reported here. The percentage of positives was even somewhat higher than that among the control firemen. In other localities, however, the findings have been markedly different, as, for example, in a sampling of the residents of a small Iowa town from which several cases of amoebic dysentery had been reported. Probably the percentage of positives was higher than is normal for the State; but even so, it was less than one-third of that found in Chicago. Moreover, in that study only small cysts were observed. Any discussion of these findings would be beyond both the scope of this report and the bounds of present knowledge.

The number of positives among the controls may represent a high normal, but the number among the cases certainly indicates a very abnormal situation. This high proportion of positives speaks clearly for a wide-spread and probably recent exposure to infection. It cannot be explained on the assumption that a nonspecific infection occurred in previous carriers of *E. histolytica*.

The differences in the laboratory findings were definite in those cases classified as mild, moderately severe, and severe. It is particularly to be noted that the large cysts (generally regarded as those of a more highly pathogenic organism as compared with the small cyst races) were found in 24 percent of the severe illnesses, in contrast to the 6 percent in the mild infections. Furthermore, the precysts and motile forms were more commonly observed in the infections classified as severe.

In considering the types of organisms found, it is to be noted that from the same person all types and stages were occasionally identified. This tended to be true particularly in the severe infections. Of the 65 in this group which showed small cysts, 29 had these alone. In the others they were found in association with large cysts, precysts, or motile forms. In the mild cases, on the other hand, the small cysts only were commonly observed, as was true in 12 of the 13 cases with this positive finding.

Except for the positive protozoological findings, the stool examinations were essentially negative. A small but representative number

of fresh stools were studied bacteriologically. *B. typhosus* was isolated from an individual in whom the disease was not yet suspected. Other than this, pathogenic organisms were not identified. Cellular exudate was also usually lacking. Pus cells were rarely observed, and, with few exceptions, red blood cells were not present. Occasionally mucus was evident, but the characteristic bloody mucus of amoebic dysentery was very rarely encountered in the study of the stool specimens from firemen.

AMOEBIC DYSENTERY AMONG SPECTATORS

Coincident with the above investigation, careful observation was made of all cases of amoebic dysentery reported to the Chicago Board of Health. Routinely, inquiry was made as to possible exposure at the stockyards fire. Eleven cases apparently from this source have come to our attention. The diagnosis could not always be made without some reservation, but that of amoebic dysentery seemed warranted.

In two the clinical picture, with complicating liver abscess, was classical. In one of these, an acute diarrhea occurred 2 days following liberal drinking of the polluted water at the stockyards fire. From this ailment the patient recovered promptly and apparently completely. Ten days later, however, he again began to have abdominal pain and diarrhea. There was marked tenesmus and gross blood in the stool. Eight days later, right upper quadrant pain began and progressively became worse. The patient was admitted to the hospital, and a diagnosis of acute purulent cholecystitis was made. At operation, however, a large liver abscess was found. The second complicated case also began with a severe diarrhea 2 days after the fire. For almost 4 weeks the patient continued to have 10 to 15 stools daily. In these mucus and blood were noted repeatedly. The diarrhea abated, but the patient continued to be very weak and to lose weight. Fever was noted soon after, and midepigastric pain appeared. Though studied in a hospital, the ailment was not diagnosed. Anemia developed and became worse, and upper abdominal tenderness was found. After several weeks at home and a total 2½ months of illness, the patient entered a teaching and research hospital. For almost 3 weeks the working diagnosis of cholecystitis was retained. Unable to substantiate this, other possibilities, including amoebic dysentery, were explored. On the second examination trophozoites were found in the stool. There was some improvement under antiamoebic treatment, but the evidence of upper abdominal abscess continued. Late in the illness one abscess was drained surgically, but the patient did not improve and died after an illness of 4 months and 1 week. At autopsy, pus collections were found in the

right pleural cavity, in the subdiaphragmatic area, in the liver, in the upper peritoneal cavity, and in the pelvis.

In four other cases the clinical nature of the illness and the laboratory findings left no question as to the accuracy of a diagnosis of amoebic dysentery. In one of these the illness began as an early and acute diarrhea, which about 10 days later gradually assumed the characteristics of amoebic dysentery. Two of the other three cases began after an incubation period of 2 to 3 weeks and the third during the seventh week after the fire.

The remaining 5 cases were milder and less typical. Four began within 1 to 2 days after the fire and the other 10 days later. The laboratory findings pointed to a diagnosis of amoebic dysentery, but on clinical grounds the illnesses could not be differentiated from nonspecific enteritis.

EPIDEMIOLOGICAL DATA

The major points in the epidemiology of this outbreak of typhoid fever, enteritis, and amoebic dysentery have already been stated. The nature of the evidence was unusually clear. All the data pointed to one source and to one source only for these infections. The following information has been collected:

1. Those who later developed these illnesses had been at the stockyards fire.

2. Almost all were known to have used, while there, a supply of drinking water which was later shown to be heavily polluted.

3. Similar infections were rarely encountered among those who had not been at the fire. During the period of the epidemic, only three scattered cases of typhoid fever from other sources were reported. We did continue to see the usual number of sporadic cases of amoebic dysentery, but these did not have the early acute diarrhea. For a period the number of diagnosed and reported cases of this disease was approximately doubled by those originating apparently at the fire.

4. We found no firemen who had taken even one moderate drink of the polluted water who escaped illness. Company officers were questioned repeatedly, and all have said that all the firemen who drank this water developed symptoms. Such evidence as was obtained from the typhoid cases suggests that some did not have the early acute diarrhea, but men so ill and with mental faculties somewhat dulled might easily have forgotten a diarrhea which had occurred 2 to 3 weeks previously.

5. Firemen who drank only city water did not develop any of these illnesses. One company officer, knowing the nature of the stock yards supply, warned his men and arranged to have other water

provided for drinking purposes. None of this company developed symptoms, even though they worked in the heart of the area with the polluted water supply. Moreover, men who preferred beer or coffee and contrived to get them remained well.

6. The source of the water was such that the occurrence of the above-described infections would be expected. Furthermore, laboratory samples collected on the night of the fire showed the grossest sewage pollution in the private stockyards water system. The city water, however, though abnormally turbid, was bacteriologically satisfactory.

7. All who developed infection were males, and, among the spectators, were chiefly adolescents or young adults. This was the group which made up the more curious, venturesome, and troublesome spectators who swarmed the pens and explored the ruins. Women, younger children, and older males viewed the conflagration from greater distances, well beyond the private water supply of the yards.

8. The dates of onset and the explosive nature of the outbreak support the conclusion that infection was contracted at a common place on the day of the fire.

DISCUSSION

It is agreed by all authorities that amoebic infection is a disease spread only by human fecal contamination, as is true of typhoid fever, bacillary dysentery, and cholera. We believe that the study here reported has provided definite evidence that amoebic dysentery also may be water-borne. Apparently through this one exposure to polluted water, about 100 firemen must have acquired *E. histolytica*, as this represents the difference between the number of positives found in those exposed and the normal expectancy as indicated by the controls. It is safe to assume that the ratio of infection between firemen and spectators was approximately the same for amoebic infestation as for typhoid. There were 3 cases of the latter in firemen in a total of 69, giving a ratio of 1 to 22. Apparently, therefore, in the neighborhood of 2,200 civilians acquired *E. histolytica* at the time of the fire. Thus, we believe that this study also shows clearly that amoebic infestations may be spread in an epidemic manner.

Undoubtedly a very large number of amoebic infections did result from drinking the polluted water at the stockyards fire. However, there were few cases of classical amoebic dysentery. Are these observations compatible? Apparently it is true that the clinical entity, amoebic dysentery, occurs in only one of several who acquire *E. histolytica*. From the calculated 2,200 recently infested civilians there were reported but 6 undoubted cases of amoebic dysentery and 5 other mild infections which were also so diagnosed. Among the

firemen the early administration of a specific amoebicide to all with diarrheal disorders may perhaps have cut short some infections which otherwise would have developed into typical and severe amoebic dysentery.

In evaluating the above-reported findings it is to be borne in mind that the examination of one stool specimen is not sufficient to determine whether a person actually carries *E. histolytica*. The positives found among the firemen would certainly have been increased if as many as three or more tests had been made on each man. The relationship between controls and cases, however, would probably have been little affected. We can see no reason for believing otherwise than that more examinations would have served merely to strengthen our conclusions.

SUMMARY AND CONCLUSIONS

During the stockyards fire in Chicago in May 1934, water heavily polluted with fresh sewage was used for drinking purposes by many firemen and spectators. There followed a large but undetermined number of cases of acute diarrhea, 69 of typhoid fever, and 2 of paratyphoid fever. Laboratory studies revealed that a high percentage of those exposed had become infested with *E. histolytica;* and the more severe the symptoms, the higher the percentage.

Six cases of undoubted amoebic dysentery, two with complicating liver abscess, were recognized among those exposed. Six other mild cases (1 fireman and 5 spectators) were also diagnosed as amoebic dysentery and reported to the board of health. The evidence has led to the opinion that many of the other illnesses with intestinal symptoms were also the result of *E. histolytica* invasion.

Therefore, we conclude that infestations with *E. histolytica* may occur in association with water-borne epidemic diseases, and, furthermore, that the control of amoebic dysentery demands that water for human consumption be free from dangerous protozoal as well as bacterial contamination.

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VARIATIONS IN PHYSIQUE AND GROWTH OF CHILDREN IN DIFFERENT GEOGRAPHIC REGIONS OF THE UNITED STATES [1]

Physical Measurement Studies No. 2

By Carroll E. Palmer, *Consultant*, and Selwyn D. Collins, *Senior Statistician*, *United States Public Health Service*

Measurements of men conscripted for service in the World War furnished data by means of which Davenport and Love (*1*) have shown significant differences in the physical characteristics of the young male population in different geographic sections of the United States. While these authors have indicated that the differences observed are due probably to differences in the racial stocks which predominate in the various geographic subdivisions of the country, it may be postulated that part of the observed variation might have been effected by variations in the *growth* of the individuals measured. It may be postulated, for example, that certain environmental factors conducive to increased growth may be present in one locality and absent or less effective in another. Indeed evidence that certain environmental factors influence human growth is increasing. Thus Malling-Hansen (*2*), Nylin (*3*), Palmer (*4*), and others have shown marked seasonal differences in certain measurements of growth. Palmer (*5*) has reported, with respect to body weight, that some calendar years are good and others are poor "growing years." Boas (*6*) has presented evidence that the growth of children of immigrants to the United States probably is affected by environmental differences between the United States and their native lands. Spier (*7*) has pointed out that the physical measurements of Japanese children reared in the United States are markedly different from those of Japanese children in Japan.

So far as the authors are aware, no studies have been made to ascertain whether or not children in various geographic regions in the United States are different with respect to their physical measurements, or to what extent children living in different regions show differences in growth rates. Obviously, a study merely of physical measurements and of growth increments of children living in different sections of the country will not furnish conclusive data from which to evaluate the relative roles of heredity and environment in growth processes. A satisfactory method for investigating this problem completely—obviously a method not readily applicable—would consist of simultaneous observations on children of similar heredity living in different regions. The difficulties of obtaining such a controlled situation are, at the present time, quite insurmountable.

[1] From the Offices of Field Investigations in Child Hygiene and of Statistical Investigations, U. S. Public Health Service, and the Department of Biostatistics (Paper No. 190), the Johns Hopkins University. For the first paper in the series, see reference (8) in the bibliography.

However, it is felt that some suggestive information may be obtained simply through the study of averages of physical measurements and of yearly increments of growth for children living in different geographic regions. It is to this end, therefore, that the present paper is presented.

MATERIAL AND METHODS

Data for the study of this problem were collected by medical officers of the United States Public Health Service in four fairly distinct geographic sections of the country: 1) A northeastern section comprising New England and Middle Atlantic States; 2) a north central section including measurements of children from the States bordering the western Great Lakes; 3) a south central section, including children from Missouri and Kentucky on the north and Louisiana and Texas on the south; and 4) a western section, which was limited to children from Utah and Nevada. In all, nearly 30,000 school children between the ages of 6 and 15 years were measured; about 9,000 were from each of the sections, northeast, north central, and south central; about 2,000 were from the western section. Table 1 shows in some detail the geographic distribution of the children, the number measured, the dates of measurement, and the names of the medical officers making the observations. It will be noted that the same examiner made all of the measurements in a given section and that the same officer worked in both the north and south central regions.

The anthropometric data collected include, among other things, measurements of body weight, standing height, sitting height, the anteroposterior and transverse chest diameters, chest circumference, and vital capacity. Scales, measuring rods, compasses, and spirometers were calibrated by the United States Bureau of Standards before being used. The three observers studied in collaboration the technique of taking the measurements, and, although no quantitative study of individual difference in technique was made, it may be assumed that the methods used were sufficiently similar to permit comparison of the measurements of the different workers. Details of these methods are given in the first of this series of papers (*8*).

These data, while subject to some notable defects, possess certain important advantages for a study of this kind. The principal advantages lie in the general homogeneity of the populations observed. First, the children, except for a relatively small number in the western section, are from large urban centers. Second, all of them are native-born of the third generation, that is, native-born of both native-born parents and grandparents. Third, all were attending school and therefore represent a group of fairly healthy children in each section; furthermore, no grossly defective or seriously crippled children were included. About one-half of the children had no significant physical defects whatsoever.

TABLE 1.—*Geographic distribution of the children measured (children of native white parents and grandparents)*

Locality	Dates measurements were made	Examiner	Number of children 6 to 15 years of age who were measured		
			Both sexes	Boys	Girls
All sections, total			28,674	14,318	14,356
Northeast, total		Dr. E. B. Sterling	9,377	4,630	4,747
Portland, Maine	Oct. 11 to Nov. 15, 1923	do	1,422	695	727
Manchester, N. H	Nov. 20 to Dec. 5, 1923	do	534	259	275
Burlington, Vt	Dec. 6–17, 1923	do	532	269	263
Fall River, Mass	Jan. 2-9, 1924	do	321	149	172
Hartford, Conn	Mar. 3-28, 1924	do	992	490	502
Syracuse, N. Y	Jan. 22 to Feb. 21, 1924	do	1,751	883	868
Trenton, N. J	Apr. 1-11, 21, May 6, 1924	do	1,661	801	860
Philadelphia, Pa	May 9 to June 21, 1924	do	2,164	1,084	1,080
North central, total		Dr. M. V. Veldee	8,575	4,420	4,155
Minneapolis, Minn	Sept. 17 to Oct. 5, 1923	do	1,838	949	889
Milwaukee, Wis	Oct. 10-31, 1923	do	1,153	617	536
Detroit, Mich	Nov. 27-28, 1923	do	1,798	912	886
South Bend, Ind	Dec. 6-20, 1923; Jan. 7-9, 1924	do	1,899	967	932
Muncie, Ind	Jan. 15-28, 1924	do	1,079	550	529
Quincy, Ill	Feb. 1-16, 1924	do	808	425	383
South central, total		do	8,779	4,305	4,474
Houston, Tex	Feb. 25 to Mar. 18, 1924	do	1,680	821	859
New Orleans, La	Mar. 24 to Apr. 9, 1924	do	1,718	847	871
Little Rock, Ark	Apr. 15-24, 1924	do	1,265	619	646
Nashville, Tenn	Apr. 29 to May 9, 1924	do	1,062	501	561
Louisville, Ky	May 13 to June 5, 1924	do	1,770	869	901
St. Louis, Mo	Apr. 9 to June 7, 1923	do	1,284	648	636
Western, total		Dr. V. R. Anderson	1,943	963	980
Provo, Utah	Dec. 6, 1922 to Mar. 1, 1923	do	855	418	437
Salt Lake City, Utah	Nov. 27-29, Dec. 4-8, 1922	do	211	109	102
Bountiful, Utah	Oct. 19 to Nov. 16, 1922	do	257	138	119
Kaysville, Utah	Oct. 10-18, 1922	do	44	26	18
Las Vegas, Nev	May 28-31, 1923	do	93	39	54
Elko, Nev	Nov. 20-25, 1923	do	133	62	71
Carson City, Nev	Apr. 5-12, 1923	do	100	44	56
Unincorporated places in Nevada [1]		do	250	127	123

[1] St. Thomas, Nev., Apr. 23-27, 1923; Overton, Nev., May 1–10, 1923; Bunkerville, Nev., May 13–15, 1923; Mesquite, Nev., May 18, 1923; Minden, Nev., Sept. 25, 1923; Gardnerville, Nev., Sept. 26-27, 1923; Virginia City, Nev., Oct. 9, 1923, Gold Hill, Nev., Dec. 4, 1923; Silver City, Nev., Dec. 5, 1923; Comstock, Nev., Dec. 10, 1923.

The important imperfections in the data, so far as this study of differences in children from the various sections is concerned, are three.

First, the time of year in which the measurements were made was not exactly the same in each geographic section. Measurements made in the northeast section were distributed fairly evenly over the school year of 1923–24; those in the north central section were begun in the fall of 1923 and were completed by February; those in the south central section were made in the spring, either in 1923 or 1924; most of the measurements in the western section were begun and finished in the fall or early winter of 1922 and 1923. Thus, seasonal variation in growth may account for some difference in the various localities.

However, rough calculations based on observations of the seasonal and yearly fluctuations in growth (*3*, *4*) have indicated that no very large differences among the four sections will arise as a result of these factors. In growth increments, calculated as the differences between means of successive age groups, the error introduced by variation in the season of measurement will be negligible.

Second, the geographic grouping used introduces some error. Thus, despite the fact that the entire group measured is what may be designated "old American stock", it seems not altogether satisfactory, for example, to group together children of probably largely Dutch descent in Philadelphia with those of probably English descent in Hartford, or the children of probably largely Scandinavian descent in Minneapolis with those of English descent in Muncie, Ind. However, to obtain groups of sufficient size for reliable comparisons, and because it seemed desirable to make the study one of differences between broad geographic regions, the only method of grouping which seemed feasible or practicable was the one adopted.

Third, errors may arise as a result of possible differences in the technique of measuring of the three examiners, and although this technique was standardized, it is not impossible that even small variations in the methods of measuring might account for some of the differences between the geographic sections. Obviously, this source of error does not apply to differences between the north and south central regions, where the same person made the measurements; and, also, it does not apply to that part of the study which deals with yearly increments calculated as the differences between averages for successive age groups. Standing height and weight measurements, however, should be reasonably comparable in all areas, as the techniques for making these measurements probably are quite standardized and the errors due to variation in technique would be less than in chest measurements and sitting height.

RESULTS

Averages of measurements for the four sections.—Tables 2 and 3 and figures 1 and 2 give data for the comparison of the physical characteristics of children in the four geographic regions. The table shows the number of children in each subgroup and the averages of measurements of weight, standing and sitting heights, transverse and anteroposterior chest diameters, chest circumference and vital capacity, for each section and for all sections taken together. The averages in the tables are expressed in the units in which the measurements were made. Figure 1 shows, for boys and girls in yearly age classes, the differences between the four geographic sections in terms of the *deviations of the sectional averages from the averages for "all sections."* Figure 2 shows, similarly, geographic differences for three calculated

indexes of body form, the height-weight index, the relative trunk-length index, and the thoracic index. The height-weight index is expressed in terms of pounds per inch of height and is the quotient, $\frac{\text{average weight (in pounds)}}{\text{average height (in inches)}}$; the relative trunk-length index is expressed

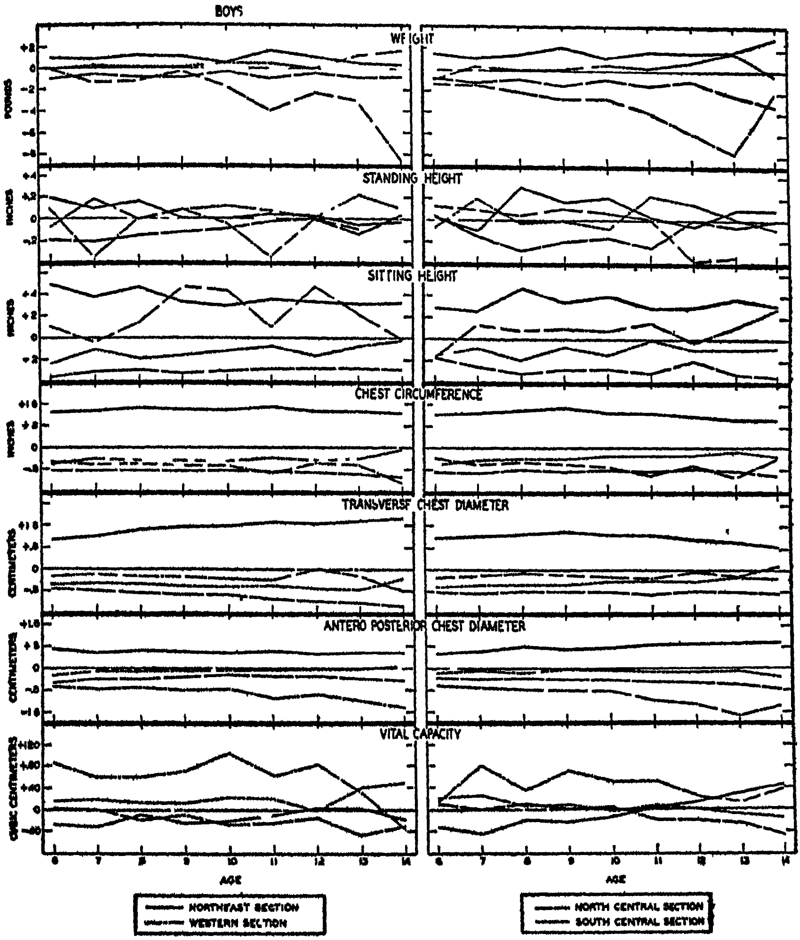

FIGURE 1.- Deviations of mean measurements of children in different geographic sections of the United States from mean measurements of children in "all sections" (children of native white parents and grandparents.)

as the percentage, $\frac{\text{(100) average sitting height (in inches)}}{\text{average standing height (in inches)}}$; the thoracic index, as the percentage,

$$\frac{\text{(100 average tranverse chest diameter (in centimeters)}}{\text{average anteroposterior chest diameter (in centimeters)}}.$$

Three facts of general interest may be noted from the tables and graphs. *First*, it is clear that the deviations of the regional averages are, in most instances, sufficiently uniform and consistent to permit a definite ordering of the relative magnitude of the measurements and indexes for children in the different regions. *Second*, there is a close correspondence between the deviations of boys and girls; that is, if the average for boys in any section deviates from the average of boys in all sections, a similar deviation is found for the girls of that section. *Third*, the deviations of the sectional averages remain fairly constant, on an absolute scale, over the whole age range from 6 to 14 years.

Other facts of a more detailed nature may be noted. Thus it will be observed that children from the northeast section tend in a general

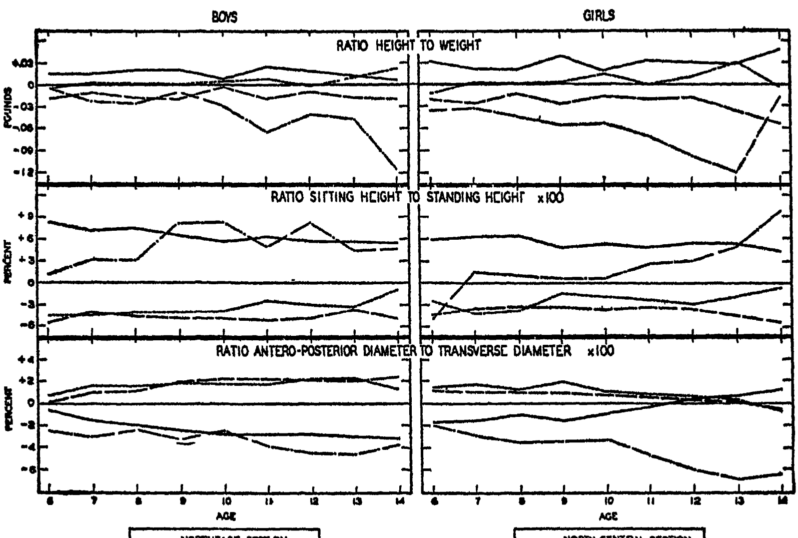

FIGURE 2.—Deviations of mean indexes of body build of children in different geographic sections of the United States from mean indexes of children in "all sections." (Children of native white parents and grandparents.)

way to be the largest, those from the north-central area the next largest, those from the south-central section the third largest, and children from the western region the smallest. With respect to weight, this order is maintained quite consistently. With respect to height, the differences between the areas fluctuate somewhat irregularly and it is possible only to state that boys and girls from the northeast and north-central regions tend to be slightly taller than those from the south-central and western sections. In sitting height the order of size is changed by the fact that western children take second place. The two diameters and circumference of the chest are markedly greater for children from the northeast section, while

the interregional differences between the other groups are small and somewhat irregular. The order of size in vital capacity, beginning with the largest, is as follows: Western, north central, northeast, and south central. This order is not followed by chest circumference or any of the other chest measurements, and is difficult to explain. In making the measurements of vital capacity, however, a Narragansett wet spirometer was used in the western section, while Sanborn wet spirometers were used in the other sections. Although the four instruments used were carefully calibrated and their readings were presumably comparable, the possibility that the regional varia-

TABLE 2.—*Mean measurements of children in four geographic regions in the United States (children of native white parents and grandparents)*

BOYS

Measurement and section	Age in years, nearest birthday								
	6	7	8	9	10	11	12	13	14
Weight (pounds):									
All sections	45.82	49.77	55.26	60.76	66.87	73.40	80.07	89.29	99.44
Northeast	46.79	50.56	56.46	61.85	67.27	74.87	81.13	89.83	99.73
North central	45.56	50.04	55.39	60.87	67.25	73.98	79.91	90.18	100.99
South central	44.75	48.98	54.22	59.59	66.52	72.23	79.57	88.23	98.45
Western	45.09	48.33	53.94	60.26	65.16	69.30	77.76	86.31	90.89
Standing height (inches):									
All sections	45.16	47.04	49.26	51.27	53.20	55.08	56.84	59.07	61.23
Northeast	45.36	47.14	49.43	51.29	53.19	55.12	56.85	59.00	61.20
North central	45.09	47.23	49.25	51.35	53.33	55.16	56.84	59.29	61.32
South central	44.97	46.83	49.11	51.15	53.11	55.05	56.83	58.92	61.27
Western	45.26	46.68	49.25	51.35	53.15	54.72	56.84	58.96	60.35
Sitting height [1] (inches):									
All sections	24.37	25.10	25.97	26.76	27.47	28.15	28.84	29.74	30.79
Northeast	24.85	25.49	26.43	27.10	27.78	28.50	29.17	30.05	31.12
North central	24.13	24.99	25.77	26.59	27.34	28.06	28.67	29.66	30.78
South central	24.01	24.79	25.66	26.43	27.17	27.85	28.56	29.46	30.51
Western	24.47	25.06	26.11	27.22	27.90	28.24	29.31	29.95	30.64
Chest circumference (inches):									
All sections	22.87	23.33	23.90	24.60	25.39	26.06	26.83	27.81	28.98
Northeast	24.15	24.63	25.43	26.02	26.08	27.57	28.23	29.20	30.28
North central	22.25	22.80	23.51	24.13	24.79	25.64	26.33	27.40	28.90
South central	22.02	22.48	23.14	23.72	24.49	25.13	25.95	26.85	27.94
Western	22.32	22.70	23.30	23.91	24.61	25.13	26.28	27.15	27.69
Transverse chest diameter (centimeters):									
All sections	19.03	19.40	21.07	20.67	21.21	21.89	22.54	23.33	24.25
Northeast	20.15	20.74	21.53	22.21	22.83	23.65	24.22	25.20	26.16
North central	18.44	18.94	19.53	20.03	20.58	21.27	21.82	22.60	23.93
South central	18.31	18.67	19.18	19.68	20.28	20.77	21.41	22.12	22.84
Western	18.75	19.28	19.81	20.42	20.91	21.48	22.56	23.10	23.43
Anteroposterior chest diameter (centimeters):									
All sections	14.29	14.51	14.75	15.09	15.45	15.89	16.29	16.89	17.64
Northeast	15.02	15.13	15.40	15.69	15.96	16.51	16.83	17.44	18.20
North central	14.00	14.42	14.67	15.02	15.35	15.82	16.26	16.89	17.74
South central	13.78	14.11	14.33	14.74	15.20	15.56	15.94	16.47	17.16
Western	13.62	13.78	14.08	14.27	14.68	14.76	15.31	15.66	16.16
Vital capacity (cubic centimeters):									
All sections	1,063	1,217	1,402	1,567	1,752	1,935	2,121	2,368	2,658
Northeast	1,036	1,183	1,393	1,543	1,732	1,925	2,123	2,365	2,637
North central	1,078	1,236	1,414	1,579	1,778	1,955	2,119	2,408	2,706
South central	1,065	1,217	1,383	1,559	1,725	1,912	2,104	2,317	2,628
Western	1,146	1,278	1,462	1,638	1,856	1,997	2,204	2,395	2,621
Number of children:									
All sections	922	1,600	1,679	1,813	1,698	1,735	1,714	1,646	1,317
Northeast	323	527	529	587	557	553	569	546	397
North central	367	492	509	546	477	515	494	517	468
South central	193	440	511	531	536	552	539	509	399
Western	39	141	130	149	128	115	112	74	53

[1] Sitting height measured by Dreyer method (see reference 9).

tion might be due to differences in the instruments used makes it advisable to accept only provisionally the observed interregional differences in vital capacity.

The index of general body build, expressed in terms of pounds per inch of height, shows regional differences similar to those observed for body weight. Thus the stockiest children come from the northeast section; those of intermediate build from the north-central and south-central regions, and the least stocky from the western area. Sectional deviations of relative trunk length, expressed as the percentage that sitting height is of standing height, show that children from the

TABLE 3.—*Mean measurements of children in four geographic regions in the United States (children of native white parents and grandparents)*

GIRLS

Measurement and section	Age in years, nearest birthday								
	6	7	8	9	10	11	12	13	14
Weight (pounds):									
All sections	44.91	48.56	53.41	59.59	65.71	74.27	83.31	94.63	102.90
Northeast	46.45	49.65	54.83	61.78	66.86	76.13	84.95	96.47	106.05
North central	44.14	48.93	53.48	59.77	66.34	74.66	84.07	96.39	102.62
South central	44.00	47.21	52.55	58.06	64.71	72.84	82.28	92.34	99.70
Western	43.48	47.14	51.27	56.84	63.01	70.40	77.32	86.86	100.82
Standing height (inches):									
All sections	44.81	46.66	48.93	50.94	52.95	55.17	57.18	59.85	61.22
Northeast	44.85	46.57	49.23	51.11	53.16	55.20	57.44	59.97	61.33
North central	44.73	46.85	48.90	50.95	52.87	55.41	57.63	59.87	61.14
South central	44.85	46.51	48.64	50.74	52.78	54.92	57.49	59.77	61.22
Western	44.95	46.76	48.97	51.06	53.02	55.19	57.09	59.50	60.61
Sitting height [1] (inches):									
All sections	24.18	24.91	25.79	26.56	27.35	28.31	29.30	30.54	31.33
Northeast	24.46	25.16	26.27	26.90	27.74	28.59	29.59	30.93	31.65
North central	24.03	24.82	25.60	26.48	27.20	28.31	29.21	30.45	31.24
South central	23.99	24.66	25.47	26.28	27.07	27.99	29.10	30.22	30.99
Western	24.02	25.03	25.86	26.65	27.42	28.47	29.29	30.67	31.62
Chest circumference (inches):									
All sections	22.32	22.86	23.38	24.14	24.88	25.92	26.87	28.01	28.85
Northeast	23.55	24.17	24.76	25.64	26.18	27.22	28.04	29.11	29.91
North central	21.68	22.41	22.95	23.72	24.56	25.66	26.54	27.88	28.56
South central	21.43	21.91	22.55	23.25	24.07	25.03	26.10	27.16	27.81
Western	21.93	22.27	22.82	23.51	24.15	24.92	26.15	26.99	28.47
Transverse chest diameter (centimeters):									
All sections	18.57	19.01	19.49	20.06	20.65	21.43	22.11	22.94	23.55
Northeast	19.77	20.25	20.83	21.49	21.92	22.60	23.20	23.98	24.41
North central	17.93	18.47	18.95	19.53	20.20	21.08	21.71	22.72	23.32
South central	17.73	18.13	18.68	19.21	19.83	20.53	21.34	22.13	22.68
Western	18.29	18.80	19.35	19.86	20.38	21.12	22.05	22.73	23.73
Anteroposterior chest diameter (centimeters):									
All sections	13.85	14.09	14.39	14.78	15.23	15.80	16.45	17.23	17.81
Northeast	14.38	14.69	15.17	15.46	15.97	16.06	17.36	18.18	18.77
North central	13.63	14.02	14.23	14.75	15.16	15.71	16.29	17.15	17.47
South central	13.46	13.64	14.00	14.33	14.77	15.25	15.93	16.61	17.05
Western	13.26	13.41	13.59	13.94	14.37	14.56	15.08	15.51	16.45
Vital capacity (cubic centimeters):									
All sections	993	1,120	1,282	1,431	1,590	1,782	2,010	2,257	2,468
Northeast	961	1,076	1,260	1,405	1,577	1,785	2,025	2,280	2,513
North central	1,017	1,147	1,286	1,440	1,586	1,788	2,011	2,218	2,454
South central	1,004	1,120	1,290	1,431	1,593	1,763	1,989	2,232	2,422
Western	1,006	1,200	1,318	1,504	1,640	1,832	2,037	2,267	2,505
Number of children:									
All sections	966	1,548	1,652	1,780	1,772	1,718	1,736	1,657	1,364
Northeast	348	524	513	551	559	563	580	550	526
North central	375	480	478	495	494	485	458	483	380
South central	193	418	508	593	580	554	579	546	420
Western	50	126	153	141	139	116	119	78	38

[1] Sitting height measured by Dreyer method (see reference 9).

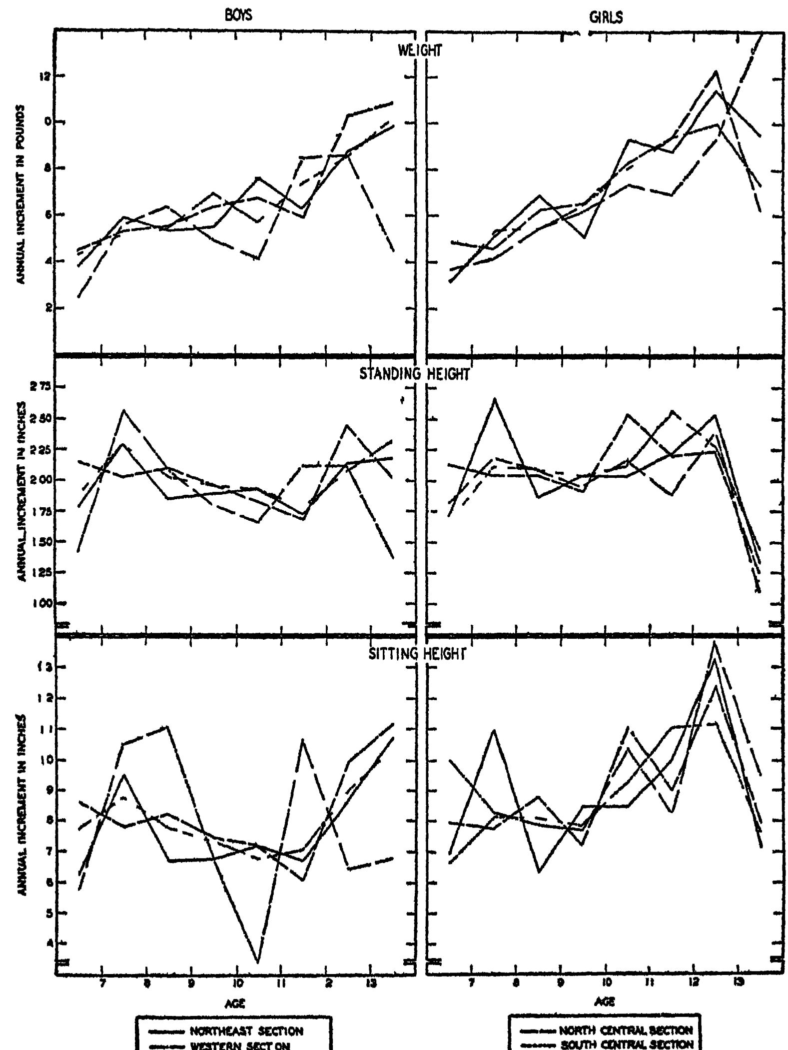

FIGURE 3—Mean annual increments of growth of children in different geographic sections of the United States (Children of native white parents and grandparents)

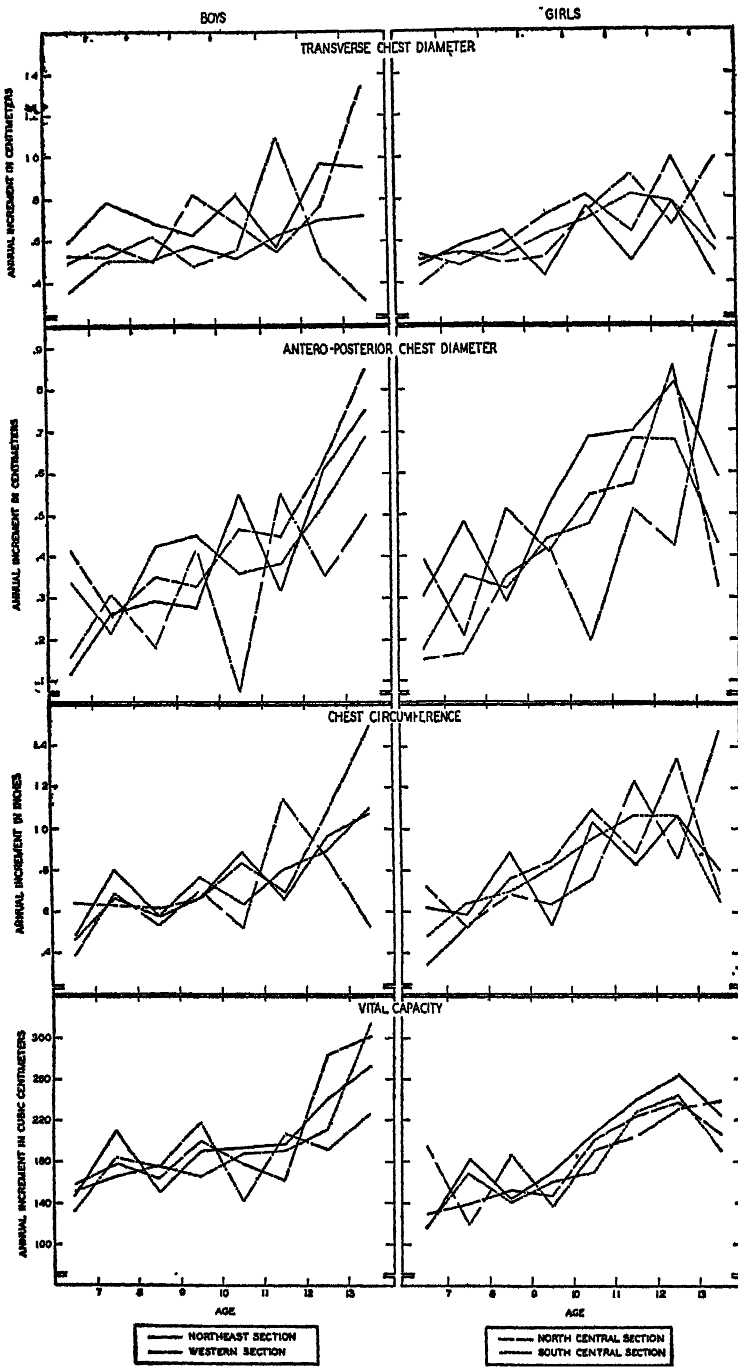

FIGURE 4.—Mean annual increments of growth of children in different geographic sections of the United States. (Children of native white parents and grandparents.)

northeast and western regions have relatively long trunks while those from the central sections have relatively long legs. The relative thickness of the chest, as measured by the ratio of anteroposterior diameter to transverse diameter, is greatest for children from the central areas and least for those from the western and northeastern sections. Thus children from the eastern and western sections have relatively shorter legs and flatter chests than those from the central districts.

Growth increments of children in different sections.—Tables 3, 4, and 5 and figures 3 and 4 give data for the comparison of yearly growth increments calculated as the differences between averages of measurements of successive age classes. These data show the characteristics of growth usually found from such analyses. The significant findings for this study, however, lie in the comparison of increments for the different geographic subdivisions. Study of the tables and graphs from this viewpoint indicates that no section shows a consistent difference from any other section. Thus the four lines representing the age changes in annual increments cross and recross each other very irregularly.

In this connection it must be noted, despite the rather large numbers of cases involved, that the data may not be extensive enough to bring out small differences in such highly variable measures as growth increments.

SUMMARY

This paper deals with physical measurements of children of native white parents and grandparents in four geographic sections of the United States: 1) a northeastern section of New England and Middle Atlantic States; 2) a north central section, States bordering the western Great Lakes; 3) a south central section, from Kentucky to Texas; 4) a western section, limited to Utah and Nevada. The data consist of measurements of weight, standing and sitting heights, anteroposterior and transverse diameters of the chest, chest circumference, and vital capacity of approximately 30,000 children between 6 and 15 years of age. Analysis of the data in age and sex specific classes for each section shows consistent differences between the mean measurements of children in the various geographic subdivisions. On the whole, children from the northeastern section tend to be the largest, those from the north central area the next largest, children from the south central region are third largest, and those from the western section are the smallest.

Study of growth increments, calculated as the differences between averages of successive age classes, shows no consistent differences in mean increments for children in the various sections.

TABLE 4.—*Mean annual increments in the measurements of children in four geographic regions in the United States (children of native white parents and grandparents)*

BOYS

Measurement and section	Age interval							
	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14
Weight (pounds):								
All sections	3.95	5.49	5.50	6.11	6.53	6.67	9.22	10.15
Northeast	3.77	5.90	5.39	5.42	7.61	6.26	8.70	9.90
North central	4.48	5.35	5.48	6.38	6.72	5.94	10.27	10.81
South central	4.24	5.24	5.37	6.92	5.72	7.34	8.66	10.22
Western	2.64	5.61	6.32	4.90	4.13	8.46	8.55	4.58
Standing height (inches):								
All sections	1.88	2.22	2.01	1.93	1.88	1.76	2.23	2.17
Northeast	1.78	2.29	1.86	1.90	1.93	1.73	2.15	2.20
North central	2.14	2.02	2.11	1.97	1.83	1.68	2.46	2.03
South central	1.86	2.28	2.04	1.96	1.94	1.78	2.09	2.35
Western	1.43	2.57	2.10	1.80	1.57	2.12	2.12	1.39
Sitting height [1] (inches):								
All sections	.731	.870	.791	.708	.674	.698	.897	1.055
Northeast	.632	.947	.669	.678	.721	.674	.872	1.076
North central	.863	.781	.824	.744	.719	.609	.998	1.120
South central	.775	.875	.775	.732	.684	.709	.900	1.046
Western	.585	1.053	1.111	.675	.339	1.071	.647	.685
Chest circumference (inches):								
All sections	.463	.663	.608	.702	.754	.776	.980	1.162
Northeast	.474	.800	.583	.663	.587	.660	.976	1.078
North central	.642	.626	.616	.663	.843	.691	1.070	1.503
South central	.461	.662	.579	.777	.640	.810	.900	1.092
Western	.378	.684	.528	.694	.527	1.145	.872	.540
Transverse chest diameter (centimeters):								
All sections	.462	.587	.591	.577	.644	.651	.798	.919
Northeast	.587	.793	.682	.618	.823	.569	.978	.900
North central	.502	.580	.496	.823	.690	.552	.775	1.336
South central	.354	.512	.501	.582	.515	.632	.710	.726
Western	.531	.525	.619	.436	.367	1.087	.532	.330
Anteroposterior chest diameter (centimeters):								
All sections	.217	.238	.344	.356	.436	.403	.599	.750
Northeast	.114	.265	.203	.272	.548	.322	.610	.756
North central	.415	.258	.340	.321	.472	.445	.624	.850
South central	.334	.213	.417	.454	.363	.354	.580	.688
Western	.153	.308	.181	.418	.075	.556	.347	.503
Vital capacity (cubic centimeters):								
All sections	154	185	165	185	183	186	242	295
Northeast	147	210	150	180	193	198	242	272
North central	158	178	165	199	177	164	284	303
South central	132	166	176	166	187	192	213	311
Western	132	184	176	218	141	207	191	226

[1] Sitting height measured by the Dreyer method (see reference 9)

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TABLE 5.—*Mean annual increments in the measurements of children in four geographic regions in the United States (children of native white parents and grandparents)*

GIRLS

Measurement and section	Age interval							
	6–7	7–8	8–9	9–10	10–11	11–12	12–13	13–14
Weight (pounds):								
All sections	3.66	4.85	6.18	6.12	8.56	9.04	11.33	8.36
Northeast	3.20	5.19	6.95	5.08	9.27	8.82	11.52	9.58
North central	4.80	4.54	6.30	6.57	8.32	9.41	12.33	6.22
South central	3.21	5.34	5.51	6.66	8.13	9.44	10.06	7.36
Western	3.66	4.13	5.57	6.16	7.39	6.92	9.54	13.96
Standing height (inches):								
All sections	1.85	2.27	2.01	2.01	2.22	2.31	2.37	1.37
Northeast	1.72	2.67	1.88	2.05	2.04	2.24	2.53	1.36
North central	2.12	2.05	2.05	1.93	2.54	2.22	2.25	1.26
South central	1.60	2.13	2.10	2.04	2.11	2.57	2.28	1.45
Western	1.82	2.20	2.10	1.96	2.17	1.90	2.41	1.11
Sitting height [1] (inches):								
All sections	.731	.883	.766	.789	.964	.995	1.230	.787
Northeast	.695	1.109	.631	.844	.849	1.004	1.336	.719
North central	.794	.777	.882	.721	1.106	.899	1.217	.790
South central	.663	.813	.811	.788	.925	1.103	1.121	.769
Western	1.011	.825	.790	.776	1.043	.821	1.384	.946
Chest circumference (inches):								
All sections	.545	.515	.766	.736	1.038	.951	1.143	.835
Northeast	.623	.589	.886	.538	1.037	.824	1.064	.804
North central	.729	.534	.769	.844	1.097	.853	1.343	.674
South central	.485	.640	.698	.815	.962	1.066	1.067	.643
Western	.345	.542	.689	.639	.771	1.234	.845	1.471
Transverse chest diameter (centimeters):								
All sections	.434	.482	.569	.598	.780	.675	.833	.611
Northeast	.480	.587	.656	.434	.768	.507	.783	.424
North central	.539	.479	.585	.729	.819	.635	1.001	.600
South central	.393	.548	.532	.624	.698	.811	.785	.557
Western	.513	.554	.504	.524	.743	.928	.675	1.002
Anteroposterior chest diameter (centimeters):								
All sections	.219	.209	.382	.451	.569	.649	.790	.573
Northeast	.309	.485	.290	.514	.689	.698	.817	.576
North central	.394	.209	.516	.410	.552	.576	.860	.390
South central	.180	.361	.327	.441	.475	.685	.680	.423
Western	.158	.172	.357	.425	.196	.517	.427	.933
Vital capacity (cubic centimeters):								
All sections	127	162	149	159	192	228	247	211
Northeast	115	184	145	172	208	240	264	224
North central	130	139	154	146	202	223	237	206
South central	116	170	141	162	170	226	243	190
Western	194	118	186	136	192	205	230	238

[1] Sitting height measured by the Dreyer method (see reference 9).

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DEATHS DURING WEEK ENDED FEB. 16, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Feb 16, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	9,040	9,775
Deaths per 1,000 population, annual basis	12 6	13 6
Deaths under 1 year of age	561	625
Deaths under 1 year of age per 1,000 estimated live births	52	58
Deaths per 1,000 population, annual basis, first 7 weeks of year	13.1	12 6
Data from industrial insurance companies.		
Policies in force	67,265,885	67,519,644
Number of death claims	12,696	11,810
Death claims per 1,000 policies in force, annual rate	9 8	9.1
Death claims per 1,000 policies, first 7 weeks of year, annual rate	10.8	10.7

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Feb. 23, 1935, and Feb. 24, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 23, 1935, and Feb. 24, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 23, 1935	Week ended Feb. 24, 1934	Week ended Feb. 23, 1935	Week ended Feb 24, 1934	Week ended Feb. 23, 1935	Week ended Feb. 24, 1934	Week ended Feb. 23, 1935	Week ended Feb. 24, 1934
New England States:								
Maine			3	2	386	2	0	0
New Hampshire				1	17	222	0	0
Vermont					4	27	0	0
Massachusetts	8	5			400	1,807	1	0
Rhode Island	2	1			55	6	1	0
Connecticut	3	2	12	6	689	30	1	0
Middle Atlantic States:								
New York	41	40	[1] 27	[1] 16	1,905	1,047	5	6
New Jersey	18	11	21	23	574	408	0	0
Pennsylvania	51	58			3,006	2,082	7	3
East North Central States:								
Ohio	74	33	53	119	760	449	17	3
Indiana	36	38	71	108	584	691	4	3
Illinois	54	34	46	33	2,341	908	13	7
Michigan	7	4	31	8	1,219	67	0	2
Wisconsin	4	16	134	78	1,598	1,024	3	2
West North Central States:								
Minnesota	4	13		2	2,272	207	1	1
Iowa	2		34	14	1,575	86	5	0
Missouri	46	52	393	206	607	1,408	4	8
North Dakota	10	8	75	10	61	36	0	1
South Dakota			4		36	624	0	0
Nebraska	9	4		27	538	22	9	0
Kansas	12	9	25	2	1,507	125	4	3
South Atlantic States:								
Delaware		2	7			167	0	0
Maryland	10	11	69	24	46	318	7	0
District of Columbia	8	4	7	2	11	473	11	0
Virginia	17	22			1,253	1,131	6	5
West Virginia	13	16	211	80	678	26	0	1
North Carolina [3]	17	25	216	77	765	3,230	5	0
South Carolina	6	6	580	880	27	529	0	0
Georgia [3]	9	14	356	206		1,880	0	1
Florida [3]	8	8	43	2	40	114	3	0
East South Central States:								
Kentucky	24	32	419	108	905	374	14	8
Tennessee	14	9	366	112	38	975	7	3
Alabama [3]	21	41	1,839	253	568	836	3	1
Mississippi [3]	7	10					4	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 23, 1935, and Feb. 24, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 23, 1935	Week ended Feb. 24, 1934	Week ended Feb. 23, 1935	Week ended Feb. 24, 1934	Week ended Feb. 23, 1935	Week ended Feb. 24, 1934	Week ended Feb. 23, 1935	Week ended Feb. 24, 1934
West South Central States:								
Arkansas	23	10	103	89	60	473	2	3
Louisiana	32	22	46	11	105	128	2	0
Oklahoma [4]	17	14	273	169	50	432	1	2
Texas [2]	44	129	661	825	267	2,028	7	2
Mountain States:								
Montana	3	2	455	64	237	32	0	1
Idaho	1		7		53	28	0	0
Wyoming		1			132	65	0	0
Colorado	8	2			593	78	4	0
New Mexico	8	5	45		23	135	2	1
Arizona	2	1	67	26	23	22	1	0
Utah [3]					15	725	0	0
Pacific States:								
Washington	4	2	18		130	200	1	2
Oregon		6	143	62	87	55	0	0
California	51	38	158	38	601	1,154	5	2
Total	728	760	7,018	3,683	26,841	26,946	160	66

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 23, 1935	Week ended Feb. 24, 1934	Week ended Feb. 23, 1935	Week ended Feb. 24, 1934	Week ended Feb. 23, 1935	Week ended Feb. 24, 1934	Week ended Feb. 23, 1935	Week ended Feb. 24, 1934
New England States:								
Maine	0	0	22	18	0	0	3	1
New Hampshire	0	0	5	17	0	1	0	0
Vermont	0	1	16	11	0	0	0	0
Massachusetts	0	0	190	237	0	0	0	0
Rhode Island	0	0	17	11	0	0	0	0
Connecticut	0	0	53	44	0	0	2	0
Middle Atlantic States:								
New York	1	0	793	789	0	0	5	7
New Jersey	1	0	149	179	0	0	1	6
Pennsylvania	0	0	508	779	0	0	13	8
East North Central States:								
Ohio	1	0	940	689	0	1	4	11
Indiana	0	0	223	248	0	1	1	2
Illinois	0	1	944	632	1	8	3	3
Michigan	0	0	371	486	0	1	3	3
Wisconsin	0	0	600	230	22	50	0	1
West North Central States:								
Minnesota	0	0	150	74	9	5	0	3
Iowa	1	0	101	71	2	2	2	2
Missouri	0	0	113	143	1	2	0	6
North Dakota	0	0	46	54	5	0	0	0
South Dakota	0	0	17	10	12	0	0	0
Nebraska	0	0	38	17	21	2	0	0
Kansas	0	0	108	80	6	0	0	2
South Atlantic States:								
Delaware	0	0	12	13	1	0	0	0
Maryland	0	0	107	73	0	0	5	1
District of Columbia	1	0	44	25	0	0	2	0
Virginia	0	0	49	44	0	1	8	6
West Virginia	0	0	153	79	0	0	4	6
North Carolina [2]	0	1	29	46	0	0	2	0
South Carolina	0	0	3	7	0	3	0	3
Georgia [2]	0	0	6	12	0	0	2	10
Florida [2]	0	0	2	2	0	0	0	2
East South Central States:								
Kentucky	0	1	87	96	0	0	8	6
Tennessee	0	0	42	40	0	2	2	4
Alabama [2]	1	0	18	21	2	0	7	3
Mississippi [2]	0	0	15	14	1	0	1	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 23, 1935, and Feb. 24, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 23, 1935	Week ended Feb. 24, 1934	Week ended Feb. 23, 1935	Week ended Feb. 24, 1934	Week ended Feb. 23, 1935	Week ended Feb. 24, 1934	Week ended Feb. 23, 1935	Week ended Feb. 24, 1934
West South Central States:								
Arkansas	0	0	8	8	1	0	2	2
Louisiana	0	0	14	42	1	2	7	6
Oklahoma [4]	0	0	21	20	4	7	7	4
Texas [2]	2	2	86	142	0	44	11	18
Mountain States:								
Montana	0	0	24	10	0	0	1	2
Idaho	0	0	15	18	0	1	0	0
Wyoming	0	0	5	6	7	1	0	0
Colorado	0	0	317	39	2	4	0	0
New Mexico	0	1	21	24	8	0	2	0
Arizona	0	0	19	17	0	0	0	2
Utah [3]	0	0	96	9	0	1	0	0
Pacific States:								
Washington	0	0		62	23	2	1	2
Oregon	0	0	62	40	4	5	0	2
California	10	5	242	271	9	5	4	4
Total	18	12	6,901	5,909	142	151	113	140

[1] New York City only.
[2] Typhus fever, week ended Feb. 23, 1935, 11 cases, as follows: North Carolina, 1; Georgia, 3; Florida, 2; Alabama, 1; Texas, 4.
[3] Week ended earlier than Saturday.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
Idaho	4		330		172		0	45	51	2
Illinois	25	198	703	9	7,910		0	3,475	8	33
Iowa	4	46	337		4,580		0	206	6	8
Kansas	3	48	141		2,844		1	482	25	5
Louisiana	3	185	105	41	496	4	5	158	9	37
Michigan	4	58	219	1	1,264		0	1,392	2	14
Montana	2	17	1,026		588		1	89	12	3
North Dakota	3	10	176		400			212		0
Ohio	49	281	1,231		2,398		4	3,187	2	14
Oklahoma [1]	10	56	848	18		4	1	191	13	30
Oregon	1	11	571		109		2	308	10	3
Pennsylvania	16	263			7,344		5	2,602	0	29
Rhode Island		20	13		118		1	77	0	0
South Dakota	2	11	47		336		2	176	42	2
Tennessee	19	89	1,906	30	181	5	0	194	1	10
West Virginia	18	130	1,333		1,960		3	701	2	17
Wyoming		1			166		0	70	55	0

[1] Exclusive of Oklahoma City and Tulsa.

January 1935

	Cases
Actinomycosis:	
Pennsylvania	1
Anthrax:	
Kansas	1
Michigan	1
Pennsylvania	1
Chickenpox:	
Idaho	44
Illinois	2,207
Iowa	301
Kansas	707
Louisiana	92
Michigan	2,180
Montana	136
North Dakota	91
Ohio	3,208
Oklahoma [1]	100
Oregon	375
Pennsylvania	5,019
Rhode Island	136
South Dakota	108
Tennessee	204
West Virginia	319
Wyoming	71
Conjunctivitis:	
Illinois	3
Kansas	5
Diarrhea and enteritis:	
Ohio (under 2 years)	11
Dysentery:	
Illinois (amoebic)	8
Illinois (bacillary)	2
Illinois (amoebic carriers)	67
Louisiana (amoebic)	1
Michigan (amoebic)	3
Ohio	1
Oklahoma [1]	1
Pennsylvania	3
Tennessee	7
West Virginia	1
Epidemic encephalitis:	
Illinois	18
Iowa	1
Kansas	3
Louisiana	2
Ohio	4
Pennsylvania	3
Tennessee	6
Favus:	
Montana	1
Food poisoning:	
Ohio	15
German measles:	
Illinois	1,830
Iowa	13
Kansas	839
Montana	2,110
Ohio	509
Pennsylvania	492
Tennessee	6
Wyoming	49
Hookworm disease:	
Louisiana	10
Impetigo contagiosa:	
Iowa	2
Kansas	1
Impetigo contagiosa—Con.	
Montana	12
Oklahoma [1]	1
Oregon	43
Tennessee	2
Lead poisoning:	
Illinois	1
Ohio	8
Mumps:	
Idaho	7
Illinois	392
Iowa	602
Kansas	419
Louisiana	2
Michigan	447
Montana	109
North Dakota	23
Ohio	1,031
Oklahoma [1]	42
Oregon	386
Pennsylvania	2,090
Rhode Island	19
South Dakota	357
Tennessee	76
West Virginia	194
Wyoming	18
Ophthalmia neonatorum:	
Idaho	1
Illinois	6
Louisiana	1
Ohio	79
Oklahoma [1]	2
Pennsylvania	5
Tennessee	1
Paratyphoid fever:	
Ohio	1
Oregon	1
Puerperal septicemia:	
Illinois	6
Ohio	2
Rabies in animals:	
Illinois	25
Kansas	4
Louisiana	32
Rabies in man:	
Pennsylvania	1
Scabies:	
Kansas	2
Montana	11
Oregon	24
Tennessee	13
Septic sore throat:	
Idaho (reports incomplete)	1
Illinois	15
Kansas	3
Louisiana	14
Michigan	50
Montana	15
Ohio	300
Oklahoma [1]	22
Oregon	11
Rhode Island	2
South Dakota	2
Tennessee	1
Wyoming	3
Tetanus:	
Illinois	2
Louisiana	3
Trachoma:	
Illinois	3
Louisiana	1
North Dakota	1
Ohio	1
Oklahoma [1]	5
Oregon	1
Pennsylvania	2
Tennessee	9
Trichinosis:	
Illinois	3
Iowa	10
Michigan	3
Ohio	12
Pennsylvania	4
Rhode Island	6
South Dakota	2
Tularaemia:	
Illinois	30
Kansas	2
Louisiana	3
Michigan	6
Ohio	14
Pennsylvania	4
Tennessee	2
Typhus fever:	
Louisiana	1
Tennessee	2
Undulant fever:	
Illinois	4
Iowa	14
Kansas	2
Michigan	6
Montana	1
Ohio	2
Pennsylvania	8
South Dakota	1
Wyoming	1
Vincent's infection:	
Illinois	27
Iowa	1
Kansas	2
Michigan	20
North Dakota	4
Oklahoma [1]	2
Oregon	8
Tennessee	3
Whooping cough:	
Idaho	22
Illinois	880
Iowa	55
Kansas	222
Louisiana	3
Michigan	788
Montana	143
North Dakota	55
Ohio	894
Oklahoma [1]	82
Oregon	40
Pennsylvania	1,855
Rhode Island	41
South Dakota	58
Tennessee	131
West Virginia	325
Wyoming	16

[1] Exclusive of Oklahoma City and Tulsa.

WEEKLY REPORTS FROM CITIES

City reports for week ended Feb. 16, 1935

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Maine:											
Portland	0	1	0	0	5	0	0	0	0	4	29
New Hampshire:											
Concord	0	---	1	0	1	1	0	0	0	0	21
Nashua	0	---	---	1	---	0	0	---	0	0	---
Vermont:											
Barre	0	---	0	0	0	0	0	0	0	9	7
Burlington	0	---	0	12	0	5	0	0	0	0	5
Massachusetts:											
Boston	7	---	2	9	42	35	0	10	0	21	239
Fall River	0	---	0	276	1	1	0	4	0	13	34
Springfield	0	---	0	100	0	5	0	0	0	9	31
Worcester	0	---	0	2	8	20	0	2	0	6	---
Rhode Island:											
Pawtucket	0	---	0	2	0	0	0	0	0	0	17
Providence	1	1	0	4	5	11	0	0	0	0	56
Connecticut:											
Bridgeport	0	8	2	2	4	8	0	1	0	2	43
Hartford	---	---	---	---	---	---	---	---	---	---	---
New Haven	0	2	1	27	8	3	0	1	0	0	59
New York:											
Buffalo	3	---	1	195	25	53	0	9	0	29	159
New York	35	21	21	341	163	306	0	69	2	187	1,550
Rochester	0	---	0	220	6	17	0	1	0	10	70
Syracuse	0	---	2	25	3	4	0	1	1	3	60
New Jersey:											
Camden	2	---	2	0	4	4	0	3	0	0	45
Newark	0	---	5	100	12	14	0	12	0	38	129
Trenton	0	---	0	13	5	12	0	1	0	1	37
Pennsylvania:											
Philadelphia	7	7	3	8	49	88	0	28	0	113	583
Pittsburgh	6	9	6	311	38	37	0	11	0	18	219
Reading	0	---	1	7	0	6	0	0	0	8	23
Scranton	0	---	---	214	---	1	0	---	0	5	---
Ohio:											
Cincinnati	5	---	5	0	8	29	0	4	0	11	1[illegible]9
Cleveland	10	77	2	136	20	36	0	14	1	55	199
Columbus	13	3	3	60	6	46	0	3	0	0	116
Toledo	4	3	2	35	6	14	0	4	0	4	71
Indiana:											
Fort Wayne	2	---	0	5	1	4	0	0	0	0	32
Indianapolis	7	---	0	16	21	32	0	5	1	10	---
South Bend	0	---	0	28	5	5	0	0	0	0	[illegible]0
Terre Haute	0	---	0	1	0	2	0	0	0	0	10
Illinois:											
Chicago	17	13	7	507	69	536	0	44	0	71	708
Springfield	0	---	0	1	1	10	0	0	0	8	25
Michigan:											
Detroit	5	14	3	300	35	147	0	27	0	85	294
Flint	0	---	0	278	4	17	0	2	0	6	37
Grand Rapids	0	---	3	26	4	11	0	0	0	14	39
Wisconsin:											
Kenosha	0	---	0	196	1	16	0	1	0	19	11
Milwaukee	1	2	2	332	10	282	0	5	0	25	100
Racine	0	1	0	22	2	6	0	1	0	6	18
Superior	0	---	0	126	0	0	0	1	0	0	10
Minnesota:											
Duluth	0	---	0	386	4	4	0	0	0	0	22
Minneapolis	1	---	2	1,555	11	40	0	1	0	7	98
St. Paul	0	---	0	4	8	21	0	4	0	12	66
Iowa:											
Davenport	0	---	---	2	---	3	0	---	0	0	---
Des Moines	0	---	---	35	---	4	0	---	1	0	31
Sioux City	0	---	---	6	---	1	0	---	0	1	---
Waterloo	0	---	---	2	---	9	0	---	0	0	---
Missouri:											
Kansas City	2	---	5	144	12	28	0	6	0	1	99
St. Joseph	1	---	1	2	1	3	0	1	0	0	14
St. Louis	18	---	2	15	12	25	0	14	1	9	198

City reports for week ended Feb. 16, 1935—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
North Dakota:											
Fargo	0		0		1	3	0	1	0	2	12
Grand Forks	0					1	0		0	0	
South Dakota:											
Aberdeen	0			1		1	0		0	1	
Sioux Falls	0			0		2	0		0	0	7
Nebraska:											
Omaha	3		2	11	12	13	5	0	0	3	68
Kansas:											
Topeka	0		1	8	2	7	0	0	0	1	14
Wichita	2		0	112	6	3	0	0	0	0	22
Delaware:											
Wilmington	1		0	1	0	7	0	0	0	0	30
Maryland:											
Baltimore	2	16	5	8	26	49	0	12	1	24	240
Cumberland	0		0	2	1	0	0	1	0	0	
Frederick	0	1	0	0	1	0	0	0	0	0	4
District of Columbia:											
Washington	9		2	7	17	36	0	12	0	2	192
Virginia:											
Lynchburg	2		0	319	3	2	0	1	0	9	18
Norfolk	0		0	7	11	4	0	2	0	8	40
Richmond	1		1	73	9	4	0	3	1	1	75
Roanoke	0		0	5	1	9	0	0	0	0	9
West Virginia:											
Charleston	1	3	2	34	3	4	0	0	0	6	18
Huntington	0			11		1	0		0	0	
Wheeling	1		0	42	6	19	0	0	1	13	27
North Carolina:											
Raleigh	0		0	6	2	3	0	1	0	0	18
Wilmington	0	10	2	0	2	0	0	0	0	0	17
Winston-Salem	1	2	1	0	2	4	0	1	0	38	15
South Carolina:											
Charleston	1	68	1	0	5	2	0	1	0	0	26
Columbia											
Greenville	0		0	0	6	1	0	1	0	0	25
Georgia:											
Atlanta	0	73	6	1	6	0	0	5	0	1	79
Brunswick	0		0	0	1	0	0	0	0	0	2
Savannah	0	41	3	2	3	1	0	3	0	1	48
Florida:											
Miami	1	9	0	0	0	1	0	2	0	0	38
Tampa	1	12	7	0	2	4	0	2	0	0	39
Kentucky:											
Ashland	1	18		0		0	0		1	2	
Lexington	0		0	20	5	1	0	0	0	2	20
Louisville	4	8	0	285	19	11	0	5	0	10	81
Tennessee:											
Memphis	2		2	0	16	11	0	7	0	7	96
Nashville	2		1	0	6	4	0	0	0	7	52
Alabama:											
Birmingham	1	67	5	16	6	6	0	1	1	1	72
Mobile	0	6	3	2	3	0	0	2	4	0	28
Montgomery	2	23		9		0	0		0	0	
Arkansas:											
Fort Smith											
Little Rock	0		1	12	7	7	0	1	0	0	10
Louisiana:											
New Orleans	31	8	3	15	28	12	0	16	6	1	184
Shreveport	2		0	35	1	0	0	2	0	4	29
Oklahoma:											
Oklahoma City	1		1	0	15	4	0	1	1	2	56
Tulsa	2			8		1	0		0	0	
Texas:											
Dallas	4	10	8	0	15	8	0	6	3	6	72
Fort Worth	2		4		8	4	0	2	0	0	62
Galveston	0		0	0	4	0	0	0	0	0	19
Houston	4		1	2	11	6	0	2	1	0	69
San Antonio	1			2		5	0		0	0	
Montana:											
Billings	2		0	18	0	2	0	0	0	0	10
Great Falls	0		0		0	0	0	0	0	1	12
Helena	0		0	76	1	0	0	0	0	0	7
Missoula	0		0		1	3	0	0	0	10	4

City reports for week ended Feb. 16, 1935—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	hs all causes
Idaho:											
Boise	0	------	0	0	1	1	0	0	0	0	9
Colorado:											
Denver	5	41	2	367	6	107	1	6	0	2	95
Pueblo	1	------	0	29	2	1	0	0	0	1	10
New Mexico:											
Albuquerque	2	------	0	2	5	0	0	3	0	2	17
Utah:											
Salt Lake City	0	------	0	4	4	60	0	1	0	23	32
Nevada:											
Reno	0	------	0	0	0	3	0	0	0	0	6
Washington:											
Seattle	------	------	------	------	------	------	------	------	------	------	------
Spokane	0	1	1	81	5	4	1	0	1	0	40
Tacoma	0	------	0	2	2	0	13	0	0	0	27
Oregon:											
Portland	0	3	0	25	7	13	0	2	0	0	81
Salem	0	8	------	0	------	2	0	------	0	0	------
California:											
Los Angeles	20	119	4	16	12	65	8	13	1	8	313
Sacramento	6	------	2	27	2	4	0	3	0	0	35
San Francisco	4	12	1	1	15	11	0	13	1	5	188

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts:			
Worcester	0	1	0
New York:			
New York	1	0	0
Syracuse	1	0	0
New Jersey:			
Camden	0	0	1
Pennsylvania:			
Philadelphia	2	0	0
Pittsburgh	0	1	0
Ohio:			
Cincinnati	9	4	0
Columbus	0	1	0
Indiana:			
Indianapolis	1	1	0
Illinois:			
Chicago	6	2	0
Springfield	1	1	0
Wisconsin:			
Milwaukee	2	1	0
Minnesota:			
Minneapolis	1	0	0
St. Paul	0	0	1
Iowa:			
Sioux City	2	0	0
Missouri:			
Kansas City	0	2	0
St. Joseph	1	0	0
St. Louis	4	0	0

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Nebraska:			
Omaha	0	1	0
Kansas:			
Wichita	2	2	0
Maryland:			
Baltimore	3	2	0
District of Columbia:			
Washington	0	0	1
Florida:			
Tampa	2	2	0
Tennessee:			
Memphis	1	1	0
Nashville	0	1	0
Alabama:			
Birmingham	1	1	0
Arkansas:			
Little Rock	2	0	0
Oklahoma:			
Oklahoma City	1	0	0
Texas:			
Dallas	1	3	0
Fort Worth	1	0	0
Colorado:			
Denver	1	0	0
New Mexico:			
Albuquerque	0	0	2
California:			
Los Angeles			

Epidemic encephalitis.—Cases: New York, 1; Toledo, 1; Chicago, 1; Kansas City, Mo., 1.
Pellagra.—Cases: Los Angeles, 1.
Rabies in man.—Memphis, 1 case and 1 death.
Typhus fever.—Cases: New York, 2; Charleston, S. C., 2; Savannah, 2; Houston, 1; San Antonio, 1.

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FOREIGN AND INSULAR

CEYLON

Malaria.—The following telegram regarding malaria on the island of Ceylon, dated January 7, 1935, from the Governor of Ceylon to the Secretary of State for Colonies, at London, has been transmitted to the Public Health Service:

The northwest Province continues to be seriously affected, but the number of cases has decreased appreciably during the last 2 weeks.

In the district of Kegalla the situation is improving slightly and assistance is well organized. Malaria is now rather wide-spread in the district of Ratnapura, but the epidemic is not serious.

The number of cases remains high at Kelani, and in the valley of Maha Oya, and in a zone between two rivers, but is not increasing at the present time. The other sections of the eastern Province are affected, but not seriously.

The central Province is not greatly affected except in some regions bordering the northwest Province and the district of Kegalla, and the situation is improving.

There is very little risk for travelers remaining in the large cities and the usual tourist centers, and malaria is not observed at altitudes above 2,400 feet.

In general, the disease is not of virulent form, and the mortality is low. The deaths which occur are usually caused by cerebral malaria, convulsions in children, and weakness in persons suffering from dysentery.

CZECHOSLOVAKIA

Communicable diseases—December 1934.—During the month of December 1934 certain communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	3	1	Malaria	10	
Cerebrospinal meningitis	4		Paratyphoid fever	15	
Chicken pox	645		Puerperal fever	40	22
Diphtheria	5,369	351	Scarlet fever	2,780	30
Dysentery	27	3	Trachoma	68	
Influenza	49	7	Typhoid fever	531	46
Lethargic encephalitis	4	3	Typhus fever	8	

JAMAICA

Communicable diseases—4 weeks ended December 29, 1934.—During the 4 weeks ended December 29, 1934, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox		13	Poliomyelitis		2
Dysentery	8	11	Puerperal fever		1
Erysipelas		3	Tuberculosis	41	103
Leprosy		1	Typhoid fever	18	82

JAPAN

Kawasaki—Dysentery.—A report dated January 24, 1935, states that an outbreak of epidemic dysentery was reported on January 7, 1935, in the city of Kawasaki, near Yokohama, Japan. The number of new cases increased to 887 by January 12. Elementary schools and public nurseries were closed on January 11 for a period of 7 days and other preventive measures taken. The number of new cases gradually decreased by January 15. The total number of deaths resulting was estimated at 383.

YUGOSLAVIA

Communicable diseases—January 1935.—During the month of January 1935, certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	18	3	Paratyphoid fever	11	1
Cerebrospinal meningitis	8	3	Scarlet fever	354	38
Diphtheria and croup	916	130	Sepsis	14	8
Dysentery	22	3	Tetanus	12	5
Erysipelas	182	10	Typhoid fever	469	89
Measles	1,233	80	Typhus fever	55	6

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Feb. 22, 1935, pp. 267–279. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Mar. 29, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Ceylon—Peliyagoda.—During the week ended February 16, 1935, 10 cases of cholera with 6 deaths were reported at Peliyagoda, near Colombo, Ceylon.

Plague

Ecuador.—A report dated February 19, 1935, states that bubonic plague has been reported in Ecuador, as follows: 16 cases at Celica, Loja Province, and 14 cases near Pungala and Tixan, Chimborazo Province, Ecuador.

Siam—Nagara Rajsima.—During the week ended February 16, 1935, 1 case of plague with 1 death was reported at Nagara Rajsima, Siam.

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UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 50 MARCH 15, 1935 NO. 11

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES[1]

January 27–February 23, 1935

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease."

Influenza.—The number of cases of influenza reported for the 4 weeks ended February 23 was 35,391, which was nearly 3 times last year's figure for the corresponding period. During the preceding period this ratio was about 4, the reported number of cases being 34,610.

Table 1 shows by geographic areas the number of cases reported for recent weeks in comparison with the experience of the 3 preceding years. From the table it is evident that the epidemiclike movement was, in general, from east to west. The peak was reached in the Atlantic coast regions during the first half of January, while in the remainder of the country it was not reached until February. However, although the incidence was still relatively high in the West, by the end of the period under consideration a sharp decline was evident. The number of cases reported during this outbreak is much less than the number reported during the epidemic of 1932–33.

[1] From the Office of Statistical Investigations, U. S. Public Health Service. The numbers of States included for the various diseases are as follows: Typhoid fever, 48, poliomyelitis, 48, meningococcus meningitis, 48, smallpox, 48, measles, 47, diphtheria, 48, scarlet fever, 48, influenza, 44 States and New York City. The District of Columbia is counted as a State in these reports. These summaries include only the 8 important communicable diseases for which the Public Health Service receives regular weekly reports from the State health officers

TABLE 1.—*Number of influenza cases reported in different geographic sections during recent weeks of the winter of 1934–35 and during corresponding weeks of the 3 preceding winters* [1]

Year	Week ended—									
	Dec. 29	Jan. 5	Jan. 12	Jan. 19	Jan. 26	Feb. 2	Feb. 9	Feb. 16	Feb. 23	Mar. 2
Total:										
1934–35	3,975	6,965	10,023	7,749	9,673	10,252	9,530	8,591	7,018	5,727
1933–34	1,158	2,015	2,804	1,943	2,201	2,714	2,819	3,825	3,683	3,341
1932–33	62,323	64,318	40,057	24,663	14,839	10,880	7,304	5,731	4,637	3,643
1931–32	1,122	1,242	1,550	1,931	2,553	5,048	6,664	6,395	9,008	13,073
New England and Middle Atlantic:										
1934–35	519	641	622	288	123	144	83	73	63	95
1933–34	55	83	63	65	90	62	71	53	48	90
1932–33	1,080	2,127	3,131	2,375	1,521	1,669	505	257	233	192
1931–32	52	76	137	257	553	208	171	293	476	774
East North Central:										
1934–35	500	394	1,436	578	673	1,195	416	586	335	573
1933–34	204	143	250	163	166	301	236	329	346	284
1932–33	5,513	8,947	6,683	3,539	2,226	1,018	605	568	685	345
1931–32	106	89	180	106	199	194	470	670	1,762	1,413
West North Central:										
1934–35	117	556	442	725	530	626	765	898	531	533
1933–34	15	27	30	46	69	73	97	830	261	226
1932–33	[2] 8,930	[2] 4,313	[2] 4,234	3,655	1,177	1,045	114	269	74	85
1931–32	10	20	14	12	70	163	305	540	302	188
South Atlantic:										
1934–35	1,907	3,514	4,861	2,851	3,586	2,783	2,393	2,096	1,489	1,353
1933–34	403	1,102	809	926	1,098	1,211	913	1,232	1,271	1,016
1932–33	7,904	13,191	9,153	7,484	5,484	4,042	3,586	3,104	2,522	1,821
1931–32	540	608	577	652	708	743	850	871	1,401	1,689
East and West South Central:										
1934–35	713	1,558	1,859	2,038	3,122	3,150	4,400	3,998	3,707	2,472
1933–34	374	568	1,542	665	677	935	1,317	1,711	1,567	1,531
1932–33	27,713	27,720	13,094	4,909	2,945	1,954	1,766	1,122	768	907
1931–32	178	256	383	296	373	1,050	1,710	1,655	2,502	3,775
Mountain and Pacific:										
1934–35	159	302	803	1,269	1,639	2,354	1,473	940	893	701
1933–34	107	128	110	78	102	132	155	164	190	194
1932–33	11,183	8,020	3,762	2,701	1,486	1,152	668	411	355	293
1931–32	236	193	259	608	650	2,690	2,158	2,366	2,505	[3] 5,154

[1] Similar tables appeared in the Public Health Reports for Jan. 18, 1935, p. 72, and Feb. 15, p. 204.
[2] The following numbers of cases not included here were reported in Kansas in response to a special inquiry: Week ended Dec. 31, 1932, 27,779; Jan. 7, 1933, 7,923; Jan. 14, 2,027.
[3] Included 2,012 cases, an accumulated number, from New Mexico.

Meningococcus meningitis.—The number of cases of meningococcus meningitis rose from 307 for the preceding 4-week period to 525 for the 4 weeks ended February 23—a figure somewhat above the seasonal expectancy. The current incidence was 2.3 times that for the corresponding period last year and 1.7 times the incidence in 1933 and 1932. Each geographic area, except the New England, reported an increase over the corresponding period last year and also over the preceding 4 weeks. The greatest increases over last year were reported from the South Atlantic and East South Central sections. In the former area the number of cases (98) was almost four times that for this period last year, while in the latter area the number (81) was more than five times last year's figure. Other regions reported increases ranging from 40 percent in the West South Central to 70 percent in the Pacific area. The New England States reported a slight decrease.

Measles.—The incidence of measles was considerably above the usual seasonal expectancy. For the 4 weeks ended February 23 the number of cases totaled 91,667—approximately 37,000 more than were reported for the preceding 4-week period. The current figure did not quite reach the level of the corresponding period last year, when the disease was unusually prevalent (and the incidence reached the peak of 1926); but it was about 40,000 above the average for recent years. While each section of the country reported an increase over the preceding 4-week period, the highest incidence was confined to the East and West North Central areas, where the number of cases was more than twice that for last year, and the Middle Atlantic States, where an increase of 50 percent was noted. In other areas the incidence was below that of last year but above the average for preceding years.

Smallpox.—The number of cases of smallpox for the current period was 883, as compared with 607 last year. Texas reported 211, Nebraska 175, Washington (State) 153, Wisconsin 93, Wyoming 33, South Dakota 19, and Montana 13—a total of 697 cases, as compared with 381 for the corresponding period in 1934. The remaining cases were distributed among the other States, the number (186) being about 65 percent of that for the same States last year. At this time in 1934 an outbreak of smallpox was present in Wisconsin, and the number of cases in that State, as well as in the whole West North Central area, was then higher than for the current period; but for the other areas represented by the above-mentioned States the figures for the current period were considerably in excess of those for last year. The New England and Middle Atlantic regions remained free from the disease, and the South Atlantic States reported only 3 cases.

Diphtheria.—The current incidence of diphtheria was the lowest for this period in the 7 years for which data are available. There were 2,874 cases of diphtheria reported for the current 4-week period. In 1934, 1933, and 1932 the numbers of cases reported for this period were 3,388, 3,187, and 5,139, respectively. Compared with the corresponding period last year, the East North Central area reported a 35 percent increase, the Pacific section a 20 percent increase, the New England States practically the same incidence, and all other areas significant decreases.

Typhoid fever.—The number of cases of typhoid fever reported for the 4 weeks ended February 23 was 521, not widely different from the numbers reported for the corresponding period of 1933 and 1934. The West North Central, South Atlantic, and Mountain and Pacific sections reported about a 40 percent decrease from last year's figures for the corresponding period while in the remainder of the regions the incidence was approximately the same as that for last year.

Poliomyelitis.—As would be expected at this season, the number of cases of poliomyelitis dropped, from 118 for the preceding 4-week period to 98 for the current 4 weeks. The current incidence was about 1.5 times that for the corresponding period last year and almost twice that for 1933. In the Pacific area, which includes California, where the disease has been most prevalent, the number of cases (48) was 1.8 times that for the same period last year; in the West South Central section, 12 cases were reported; while in other regions the incidence was about on a level with that for last year.

Scarlet fever.—For the country as a whole the number of cases of scarlet fever reported for the current period was 27,838, the highest incidence for this period in recent years. Very appreciable increases over last year were reported from the East North Central, South Atlantic, and Mountain section. In the West North Central and Pacific regions the incidence was practically on a level with that of last year, and the other areas reported significant decreases.

Mortality, all causes.—The average mortality rate from all causes in large cities, as reported by the Bureau of the Census, was 12.6 per 1,000 inhabitants (annual basis). For the corresponding period in the 3 preceding years the rate was 12.7, 12.2, and 12.3, respectively. The current mortality compares very favorably with recent years. During the current period the minor epidemic of influenza, which started in the East, had spread into the central and western sections of the country; but, as in the East, it was of a mild type and apparently did not materially affect the death rate.

YELLOW FEVER

Some Recent Contributions to Our Knowledge of the Prevalence and Control of the Disease

The following excerpts regarding the occurrence of yellow fever and the recent advances in knowledge relating to this disease are taken from issues of the Boletín de la Oficina Sanitaria Panamericana and other sources, and are printed here for the information of quarantine officers and others interested in the subject. A résumé of the item concerning Colombia was printed in the Public Health Reports for January 25, 1935, but is reprinted here in order to bring together recent information in one article.

Colombia.—Commenting on the new decree on viscerotomy in Colombia, Bevier says that its purpose is to clear up the situation created by the rumors of epidemics of yellow fever which arise from time to time.

In 1923 there was an epidemic in Bucaramanga, in which the diagnosis of yellow fever was established with certainty only after and by

means of the protection test. In 1929 there was a serious epidemic in Socorro clearly due to yellow fever and another in Guadalupe (Santander) the nature of which was uncertain. In 1930 and 1931 sporadic cases of fever accompanied by jaundice occurred in the environs of Santa Marta, which, on investigation, were found not to be yellow fever.

In 1932 the results of the immune reactions verified in a large number of persons in various sections of Santander, North Santander, and Boyaca indicated that yellow fever was endemic in certain areas of these regions or that it had recently existed in them, while other zones seemed to be free.

The attention of the authorities and the public has been directed several times to Muzo, because of the suspicious epidemics which occur there. In January 1934 there were several cases; in March there were 5 cases, 4 of them fatal, and anatomo-pathological examination of 1 case proved positive for yellow fever, while the blood of a convalescent gave a positive reaction. In June there was another small epidemic, and the diagnosis was confirmed by several positive blood samples and two autopsies. In January and February 1933, a small epidemic occurred in the town of Caparrapi, and another occurred in June; and at the beginning of 1934 several deaths occurred which, from certain indications, were attributable to yellow fever.

Apparently the disease has been spreading gradually toward the west, and the prospect is alarming, because it may reach Puerto Lievano, Guaduas, Utica, or Villeta, localities where the population is probably nonimmune. At present there is a suspicious epidemic in the vicinity of Restrepo (Meta).[1] Four physicians from the National Department of Health are now studying it, and the city of Villavicencio has designated several health inspectors to control it.

Obviously yellow fever is still a problem in Colombia, and, perhaps, a menace, the importance of which is not realized by the health authorities or the public. The National Department of Health is organizing a service to study the question, which will be a part of the rural sanitation section. (Bevier, G.: Rev. Hig., October 1934, p. 369.)

Occurrence in West Africa.—Beeuwkes and Mahaffy present the results of protection tests in 7,580 sera collected in 181 communities from 8 colonies of West Africa (Nigeria, Gold Coast, Sierra Leone, Gambia, Liberia, Dahomey, Niger, and Sudan). The disease was much more frequent than was believed; approximately 25 percent of all the examples studied were positive. Few communities had escaped the disease during the present generation. Almost all the zone investigated was infectible, and positive sera were obtained even in the natives of the Jos mesa at an altitude of 1,300 meters.

[1] Four deaths from yellow fever were confirmed in this area from Nov. 1, 1934, to Jan. 12, 1935.

The studies carried on in the French colonies north of Nigeria indicate that epidemics occur in that semiarid region, but the Sahara Desert forms an efficient barrier against the infection. Yellow fever is rarely recognized in natives, and the relatively small number of cases in Europeans indicates neither the true frequency nor the distribution.

This study confirms the opinion previously advanced that there is an endemic zone in the southwestern part of Nigeria which it has not yet been possible to delimit, and which may perhaps extend west to the neighboring colonies. It has not been possible to exclude definitely endemicity in other regions, but meteorological conditions in the north of Nigeria seem to be adverse to the permanent existence of the infection, and this is probably also true in the interior of West Africa in general. Studies by ages in the population of the endemic zones disproves the opinions previously held, showing that the disease is not limited to children but that the percentage of immunes gradually increases with age, and that some individuals escape the disease entirely. The importance of these findings has also been demonstrated in the formulation of quarantine regulations, particularly for aerial navigation. The great value of piped water supplies and health services in decreasing or eliminating the infection is shown in several of the most important localities studied, particularly in Freetown, Sierra Leone, and in some communities on the coast of the Gold Coast and Nigeria. The study has recently been extended to French Cameroun, French Equatorial Africa, Belgian Congo, and Angola. Of the colonies studied, only the sera from Sudan (130 samples from two localities) were all negative.

The minute epidemiological study of the authors is accompanied by maps, tables, and graphs, and shows the figures in a table with the following headings: Name of country, name of the locality, number of samples collected, age of donors, percent of positives, age of youngest positive donor, European and African population, and last date when yellow fever was reported in the locality. (Beeuwkes, H., and Mahaffy, A. F.: Trans. Royal Soc. Trop. Med. & Hyg., June 1934, p. 39.)

Protection tests.—Summarizing the result of the protection tests verified under the auspices of the Rockefeller Foundation, Sawyer declares that, in round numbers, 9,000 human sera were tested in Lagos, Nigeria, 4,000 in Bahia, Brazil, and 12,000 in New York, or about 25,000. The method employed is the original method of Sawyer and Lloyd,[2] except that instead of a 10 percent suspension of mouse brain, a 20 percent suspension is used. This increase has decreased somewhat the sensitivity of the test, and also the possibility of accidentally obtaining positive results with sera of persons

[2] Publication No. 57 of the Pan American Sanitary Bureau.

never infected with the yellow fever virus. The samples are collected at random, generally in lots of 25, from healthy subjects who have always lived in the investigated locality. If a serum protects 6 mice, or at least 5, it is concluded that the donor has had yellow fever at some time in his life.

Besides the countries mentioned, the investigation is carried on in Canada, China, the Philippines, Malaya, India, and Australia. Of 423 samples from these countries, 7 protected; but on retest, 4 of these lacked protective action, the difference being attributed to the weak concentration of the virus used the first time. The corrected number of protective sera decreased, then, to 3, or 0.7 percent. Of the sera from African countries without yellow fever antecedents, with the exception, perhaps, of brief local importation in ports, 7 protected out of 856 (0.8 percent). These countries were as follows: Morocco, Egypt, Kenya, Tanganyika, Abyssinia, Zanzibar, Southern Rhodesia, Bechuanaland Protectorate, and the Union of South Africa. In the United States, sera of 113 persons of the Negro race from Maryland, Texas, and Florida had no protective qualities. The few positive results in countries considered as free from the disease up to the present time are doubtless due to various causes of error, such as inaccurate information from the donor as to possible previous infection, use of an accidentally weak virus, resistant mice, and existence in the blood of a protective hypothetical nonspecific substance. The results for west and central Africa will soon be published by Beeuwkes and his collaborators. Stefanopoulo, who used a different technique, obtained data for French West Africa and discovered immunes distributed with some regularity in the great territory which extends from Senegal to the western frontier of the Anglo-Egyptian Sudan.

In the regions of South and Central America where yellow fever has existed, the results uphold the opinion that the disease has really disappeared since the time when the last cases were reported. The same is true of Puerto Rico and the north coast of Colombia. The distribution of immunity in Brazil and neighboring countries is under study, but Soper and Andrade have already published a very complete local study [3] of an epidemic in a Brazilian town, showing the large proportion of a population which may be immunized without presenting visible symptoms of yellow fever, since of more than 800 persons approximately 60 percent were immunized, although there were only 19 recognized clinical cases. The protection tests show that antiyellow fever immunity is very widespread in Brazil and exists in a section in the interior of Colombia. The west coast of South America is under study.

Judging by these tests the immunity of young persons against yellow fever seems limited to two large regions—one in South America

[3] Boletín de la Oficina Sanitaria Panamericana, April 1934, p. 372. See also issue for March 1935, p. 206.

and the other in Africa. The regions where it has been discovered are much more extensive than was thought, from what was known about the disease. (Sawyer, W. A.: Bull. Off. Int. d' Hyg. pub., June 1934, p. 1057.)

In the Portuguese colony of Angola, Beeuwkes collected blood samples in 19 different regions, and among 950 sera very few were positive. The same was true in 75 examinations in San Thomé. In Angola there was a tenacious epidemic from 1860 to 1870, more than 60 years ago. The age of those examined varied between 6 and 60 years; and, contrary to what is usually observed, there was no positive more than 60 years old. In San Thomé yellow fever has never been reported. This same epidemiological phenomenon, positive tests in regions far from known foci, has been observed in other regions, for example, in the Anglo-Egyptian Sudan.

In considering the matter Jorge states that it has been desired to substitute, for the classic unity of yellow fever, a duality similar to that which has been established for other infectious diseases; and also unapparent infections have been mentioned, which would abound and even predominate during epidemic outbreaks. For the author, only a serious investigation can solve the problem. For the present we can only stand firm in the position achieved, particularly since the experience acquired shows that visible yellow fever as is shown by patients and disease may be controlled with the present resources. (Jorge, R.: Bull. Off. Int. d' Hyg. pub., August 1934, p. 1396.)

Dose of virus injected by the mosquito.—Davis fed *Aëdes aegypti* infected with yellow fever virus on very young white mice, which were immediately killed, and the extract obtained was injected in graduated doses into *Macacus rhesus.* In two experiments the tests indicated that each mosquito injected on feeding at least 100 infecting doses of virus. The virus seems rather to decrease than increase in the organism of the mosquito. Comparing the quantity of virus in the insect and in the mouse, it seems that the mosquito probably injects about 1 percent of the virus which it contains on biting. (Davis, N. C.: Am. Jour. Trop. Med., July 1934, p. 343.)

Transmission of protective qualities to offspring.—Five monkeys, offspring of mothers immune to yellow fever, showed in their sera protective qualities against the disease while they were still feeding on the mother's milk. In two cases in which the offspring were separated from the mother for 3 weeks, the serum ceased to show such properties. Of the mothers, 4 had been infected with the Asibi stock and 1 with the S. R. strain of yellow fever virus. The methods used to determine the protective power of the serum, both in the mothers and offspring, were the intracerebral method of Theiler and the intraperitoneal method of Sawyer and Lloyd. (Hoskins, M.: Jour. Imm., May 1934, p. 391.)

Dengue.—Snijders and his collaborators tested the sera of 20 volunteers inoculated experimentally with the Sumatran and Javanese virus of dengue, by means of the Theiler method and with a modification of the Sawyer method, repeating the test in some cases, without being able to discover any protection against the yellow fever virus. As controls they tested the sera of 5 persons who had had yellow fever, finding marked protection in all with the Theiler method, and in 3 out of 4 by the Sawyer method. Of the sera of 5 assistants who worked in the yellow fever laboratory, 2 showed a weak protective action with both methods, and these came from individuals who had the greatest contact with the yellow fever material.

Comparing immunity in both diseases it was stated that in yellow fever the immunity acquired is almost absolute, while it varies a great deal in dengue, being differentiated both in power and in duration. In the sera of former yellow fever patients there are almost always antibodies, often in high concentrations, while in dengue humoral immunity has not been found. It must, however, be accepted that the hypothesis has not yet been proved that under certain conditions dengue may give rise to some immunity to yellow fever. (Snijders, E. P., Postmus, S., and Schuffner, W.: Am. Jour. Trop. Med., November 1934, p. 519.)

Vaccination.—In the laboratories of the Rockefeller Foundation of New York 56 persons have been vaccinated against yellow fever. Vaccination has also been practiced in Lagos, in Bahia, and, with some modifications, by Findlay in London and by Pettit and Stefanopoulo in Paris. The method cannot be applied on a large scale because of the difficulty in obtaining the necessary quantity of human immune serum, and for the present it is reserved for susceptible persons exposed to definite risk of infection. To avoid the difficulties inherent in the use of human immune serum, Findlay uses a technique with less serum, and Pettit and Stefanopoulo have produced a very active immune serum in the horse. In the first 15 cases the cerebral tissue of the infected mouse was triturated in human immune serum, being preserved frozen and afterwards filtered. In the other 41 cases the virus was suspended in normal human serum and filtered before drying. After 2 years of preservation one of the first mixtures of virus and immune serum was tested, and the activity of the mixture was found. Immunization could be carried on with the dried virus kept more than 8 months.

The efficacy of the method in later observations has been very similar to that described in the first series. The serum of 35 persons was tested before and after vaccination, showing the acquisition of a clear protection afterwards. The serum of 11 persons was tested 2 years after vaccination, and it was ascertained that the protection was lower than shortly after vaccination, but, in general,

remained at about $^1/_{64}$ dilution, which is the highest in which the serum completely protects the mouse. In 4 persons whose sera showed a low titer, some of the virus used in the vaccination was injected intradermally, but not the immune serum, for they already had antibodies, without general reactions being observed.

Some time must still pass before an accurate opinion can be formulated on the necessity of revaccination, but it seems wise to test the vaccinated persons 2 or 3 years afterwards, if they continue to be exposed, in order to revaccinate those who show a very weak titer. As far as known no vaccinated person has contracted yellow fever; and in the personnel of the Rockefeller Foundation, both in the laboratory and in the field, there has been no case since vaccination was begun 2½ years ago, while formerly frequent accidental infections were observed in the laboratories. (Sawyer, W. A.: Bull. Off. Int. d'Hyg. pub., June 1934, p. 1072.)

Laigret describes the results obtained with the Theiler method, which consists in inoculating, without addition of any antiseptic or protective serum, living yellow fever virus, in the mutant represented by the Theiler virus. This is the French strain obtained in Dakar in 1927 and attenuated by Theiler by mouse brain passage, using a method somewhat similar to that used in antirabic vaccination. An objection which has been made to this method is that it requires 3 injections at intervals of 20 days. This period was fixed because the reactions observed have been somewhat late. With a single injection the author obtained protection experimentally in 7 out of 8 cases. In the 24 vaccinations made, no local or general reaction was observed. It seems that there is hope that vaccination can be done with 2 inoculations a week apart. The immunity, studied in two persons 10 months and 2 years after vaccination, still remained high. (Laigret, J.: Bull. Off. Int. d'Hyg. pub., June 1934, p. 1078.)

Horse serum.—Summarizing the results obtained in the Pasteur Institute, Pettit and Stefanopoulo state that the anti-yellow fever serum of equine origin advantageously supplants that from the convalescent human being in the method of vaccination of Sawyer, Kitchen, and Lloyd, also used by Findlay in London. Because of its harmlessness, the protection which it affords, and its duration (for at least 2 years), the procedure of Sawyer, Kitchen, and Lloyd is the one most to be recommended at present, and to the numerous confirmations showing its efficacy (the 56 vaccinations of Sawyer and the 264 of Findlay) should be added the few observations of the authors. The experiments made in New York and in Paris in the *Macacus* show that the volume of anti-yellow fever serum of equine origin which should be used is a fifth of the convalescent serum necessary to neutralize the virus used in the vaccination.

The authors have vaccinated 12 persons; in 2 they used the convalescent serum, and in the 10 others the horse serum. The persons vaccinated were, in general, hospitalized for 48 hours. Desensitization was practiced in persons who had received horse serum. In general all those vaccinated tolerated the vaccine well, but in 2 cases the temperature rose to 39°-39.5° C. in 36 to 48 hours after the injection, and in 2 others to 38°-38.6° C. In 6 of those vaccinated, who remained for some time in France, immunisins were found from 3 to 5 weeks and a year after vaccination. (Pettit, A., and Stefanopoulo, G. J.: Bull. Off. Int. d'Hyg. pub., June 1934, p. 1075.)

Immune serum.—The immune serum obtained from *rhesus* monkeys recovered from yellow fever, when injected within 24 to 48 hours after inoculation with yellow fever virus, was shown to be capable of preventing the fever or weakening the disease in some of the animals under experiment. At the end of 48 hours the effect is less clear. In no case did the serum prevent death when administration was postponed until the temperature of the monkey had reached 40° C. (Davis, N. C.: Jour. Immun., May 1934, p. 361.)

Immunization against yellow fever.—In Senegal, Africa, Laigret performed 3,196 inoculations with attenuated yellow fever virus, without using immune serum. Of these inoculations 2,164 were primary, 792 secondary, and 240 tertiary, all those inoculated being volunteers, and nearly all of them of the white race, a few being educated natives, such as physicians, sanitary assistants, nurses, and students of medicine. From these experiments the following conclusions are drawn: (*a*) It is possible to inoculate without danger of infecting *Aedes aegypti*, as in this region, notwithstanding every precaution and recommendation, the Syrian residents were exposed to the bites of these mosquitoes without there having occurred a secondary case of yellow fever as a result. (*b*) The practice is regarded as safe. The mildness of reactions to consecutive inoculations was shown by the fact that only 2 severe reactions were noted, and in more than 600 inoculations in women only 2 light reactions were seen. (*c*) The protective power of the serum of those inoculated was demonstrated after the first injection in two-thirds of those vaccinated. It is proposed to increase these inoculations in West Africa to the greatest extent possible. Records are kept with the idea of determining whether or not immunized persons will later develop yellow fever. The injections in these cases were given 20 days apart beginning with one tenth of a mouse unit followed by 1.6 and 16 mouse units for the second and third doses, respectively.[4] (Boyé: Bull. Off. Int. d'Hyg. pub., 2136, dbre. 1934.)

[4] This is the method of Laigret. *See* L'état actuel de la vaccination contre la fièvre jaune Ann de Med. et de Pharm Coloniales, vol 32, no , p. 78.—*Ed.*

Present status of yellow fever in the Americas.—In his address on yellow fever before the Ninth Pan American Sanitary Conference, held at Buenos Aires, November 12–22, 1934, Soper reviewed the important epidemiological developments in South America during the past 5 years. New facts have been brought to light by the application over a wide area of new methods for outlining previously endemic areas and discovering latent foci.

In spite of the enormous amount of control work done in the past, yellow fever still exists in the rural areas of northeast Brazil, in various widely separated points in the Amazon valley in Brazil, Peru, and Bolivia, and in the Magdalena and Orinoco Valleys in Colombia. Endemicity in the Amazon Valley was first suggested by the absence of reported cases in the native population of Para in 1929 while cases were occurring among foreign residents. Additional proof was furnished by positive protection tests on children from distant places in the valley in Brazil and Peru in 1931.

However, during the 5-year period considered (1929–34), the presence of yellow fever in epidemic form has not been confirmed for any important ports on the American continent, nor has any evidence of international exchange of the virus been found. Studies in Bolivia have lent added weight to the hypothesis that the Santa Cruz outbreak in 1932 was the result of endemicity. Post mortem pathological diagnoses of yellow fever have been made in livers from a number of outlying Amazon towns in Brazil in the complete absence of reported suspicious cases. A rapidly fatal disease in April 1934, at Coronel Ponce, 180 km from Cuyaba, the capital of the State of Matto Grosso, proved to be yellow fever. A puzzling feature of the situation is the occurrence of the disease in a number of places, such as Canaan, Espirito Santo, Brazil, San Ramón, Bolivia, and Coronel Ponce, Matto Grosso, in the absence of *Aedes aegypti*. At present there are no methods of control available for areas where *Aedes aegypti* is not the responsible vector.

Soper holds that yellow fever must be recognized as an international problem, needing concerted international action This should include:

(1) Antilarval services in all principal cities and in all ports of tropical America. This measure should prevent the future widespread dissemination of the virus and should greatly reduce the possibility of its international spread.

(2) Protection test surveys to outline the recent distribution of yellow fever. This will undoubtedly be found much greater than is now believed.

(3) Routine collection and examination of liver specimens from rapidly fatal febrile cases from all parts of possibly endemic areas. Smaller towns and rural areas are especially important.

(4) Careful study of all places presumed to be infected as shown by the examination of liver tissue, with special reference to the possibility of discovering vectors other than stegomyia and of vertebrate hosts other than man.

(5) Antilarval services in all towns and villages in and about known infected areas. (Soper, Fred L.: Boletín de la Oficina Sanitaria Panamericana, March 1935, p. 206.)

REPORT OF THE SUBCOMMITTEE OF THE INTERNATIONAL OFFICE

The subcommittee on yellow fever, in its report to the Permanent Committee of the International Office of Public Hygiene of Paris at its session of October 16, 1934, reviewed the data relating to this disease.

In British West Africa, of more than 7,000 blood specimens studied, 25 percent were positive by the mouse-protection test; in French Nigeria, 22 percent; in Dahomey, 30 percent; and in Anglo-Egyptian Sudan, from 0 to 16 percent were positive. In the Belgian Congo all examinations southeast of a line from Dilolo to Albertville were negative; but in the central and western parts of this colony there were adult immunes, and on the northern frontier not only adults but children were found to be immune. In equatorial French Africa there were positive blood specimens in nearly all territories; in Angola 4 percent of those examined were positive in 5 localities studied. Of 19 other places from which blood samples were secured, 8 percent were positive in 3 localities.

With respect to a case of yellow fever reported in Wau, in Anglo-Egyptian Sudan, the subcommittee declared that, while the case might be considered to be yellow fever, there was some doubt about it, and it should be regarded as suspicious only. The subcommittee reiterated its conviction that the mouse-protection test possesses great value and is of much practical importance.

Granted that there was not an entire unanimity of opinion among the members of the subcommittee, differences of opinion do not exist if positive tests in any region overwhelmingly indicate the existence of clinical yellow fever. At any rate, they recommend that the investigations be continued.

The subcommittee looked into the diagnostic value of histological examinations of liver tissue, reporting that, although such examinations are not absolutely conclusive, they constitute an important aid when accompanied by clinical data. They express the opinion that in regions where yellow fever is suspected to exist, it is well to examine in this manner all persons who die of fever of less than 10 days' duration. It is suggested that a special service be created for the purpose of making these examinations.

With regard to vaccination, the subcommittee observed that the two procedures most in use are those of Sawyer, Kitchen, and Lloyd, modified by Findlay, Pettit, and Stefanopoulo, and the method of Laigret.

The subcommittee considered immunization against yellow fever advisable, but added that the use of a vaccine consisting of living virus without immune serum, as in the method of Laigret, seems to involve certain risks that call for caution. For the time being, although the protective power of these vaccinations has been shown biologically, the subcommittee does not express itself with regard to relative values, believing that, in order to judge of the merits of each procedure, it would be necessary to study the persons vaccinated throughout their lives in countries where yellow fever is endemic. They affirm the necessity of confirmation of the results believed to be obtained, and invite the attention of all countries to the desirability of such confirmation wherever vaccination is practiced.

FINDLAY'S OBSERVATIONS

Findlay states that he is the only physician authorized by the British Government to preserve yellow fever virus and to vaccinate against the disease. He thinks that the inoculation of a living virus by itself entails danger, since the subcutaneous injection of Theiler's attenuated virus, he says, may kill monkeys, and the virus, he asserts, may be carried by mosquitoes and also change from neurotropic to viscerotropic. In addition, Laigret, Mathis, and Durieux have observed in persons vaccinated with virus alone, various reactions, including, according to Findlay, febrile attacks, nephritis, meningitis, paralysis, etc. In spite of possible serum sickness, Findlay therefore prefers the serum and virus vaccination method. As convalescent serum is always scarce and its virucidal power is weak, Findlay now uses Pettit-Stefanopoulo's immune (horse) serum. This can be obtained in practically unlimited amounts and its virucidal power is, Findlay states, much higher than that of convalescent serum. If the relative proportions of serum and virus are correctly determined, the reactions caused by the latter become mild and very infrequent, and the virus does not circulate in the blood. Following consideration of the results obtained in several hundred vaccinated persons in London, the British Government has decided to approve only the serum-virus method for use in West African colonies. (Findlay, G. M.: *Progrès Méd.*, Jan. 26, 1935, p. 156.)

IMMUNITY OF CUBANS

Recio presented before the Academy of Medicine of Paris a work relating to the immunity against yellow fever of Cubans born since 1908. Of 16 born since 1901, the date of the last big epidemic, 12

were found to be immune, while of 11 born between 1902 and 1908, and 14 born after 1908, none were immune.

In the discussion, Domínguez emphasized the importance of further study for the purpose of demonstrating that in combating another epidemic the majority of Cubans would be found to be as susceptible as foreigners. (Paris letter, *Jour. Am. Med. Assoc.*, Dec. 29, 1934, p. 2040.)

POTENTIAL PROBLEMS OF INDUSTRIAL HYGIENE IN A TYPICAL INDUSTRIAL AREA

The report of a study of the potential industrial-hygiene problems in a typical industrial area in the United States has recently been published by the Public Health Service.[1] The study was undertaken for the purpose of determining the necessity for an industrial-hygiene program in the area under consideration, and, if such a need should be present, to learn just where and to what extent the problems existed.

With the aid of funds supplied by the Civil Works Administration it was possible to employ 30 engineers, who were first given a brief training period in industrial-hygiene methods, particularly in the technique of making preliminary surveys of an industrial environment. Two simple survey forms, designed especially for the purpose, were used in the survey of 615 plants, during a period of approximately 7 weeks. These plants represented 10 main industries; the metal-products industry employed the greatest percentage of persons, 13,955 out of a total of 28,686, or 48.7 percent. The leather-products industry, consisting mostly of shoe factories, accounted for 28 percent of the personnel. The percentage distribution of the plants according to the number of workers employed showed that 48.7 percent of the plants had less than 10 employees and only 10.2 percent had 100 or more persons. These data compare very well with industrial plants in the United States as a whole, since the United States Census data for 1929 show practically the same kind of a distribution.

The information on such industrial welfare provisions as safety supervision, medical and nursing facilities, sick benefit associations, and disability statistics, disclosed that only 5 percent of the plants and about 20 percent of the workers were provided with the services of either a part or full-time safety director, and, as might be expected, most of these supervisors were found in the plants with 100 or more employees. The medical and nursing care was found to be in about the same status as the safety work. Seventeen percent of the workers

[1] The Potential Problems of Industrial Hygiene in a Typical Industrial Area in the United States. By J. J. Bloomfield, W. S. Johnson, and R. R. Sayers. Public Health Bulletin 216. Government Printing Office, Washington, 1935

had a part-time medical supervisor and only 15.3 percent had the services of a full-time physician. Nursing service of a full-time nature was found to be present for 34.1 percent of the employees with practically no part-time nursing service available.

The only type of disability statistics existing to any considerable degree in the plants under study was that of accident records, which were required by the provisions of the local compensation act. Sickness records were kept to the extent of embracing 40 percent of the population studied, most of which were in establishments having sick benefit associations. The larger plants, those employing 100 or more workers, had the greatest percentage of workers furnished with the listed industrial facilities. The small plants were lacking in important welfare provisions.

It was found that 19.5 percent of the workers made use of the common towel, and 13 percent used the common drinking cup.

Unguarded moving machinery was the most common potential source of accidental injury, 41 percent of the workers being exposed to this type of risk. Floor hazards ranked next, with 13.2 percent exposures, while 7.5 percent of the workers were not protected against the possibility of eye injuries from flying particles. In practically all plants where there was either a part- or full-time safety director, the percentage of persons found exposed to unguarded moving machinery was less than in those plants not having such safety personnel.

The data regarding the number of persons in each occupation exposed to various materials and conditions, for each of the ten groups of industries studied, showed exposure to 50 materials and conditions in the 615 plants investigated, 39 of which may be considered *potentially* hazardous from the viewpoint of *possible* systemic poisoning. Inorganic dusts, carbon monoxide, and lead and its compounds were the most important materials from a hygienic viewpoint confronting the industrial hygienist.

The report contains recommendations for the establishment of personnel in the health department, for the purpose of carrying out a constructive program of industrial hygiene. Minimum personnel requirements and a specific program for the practice of industrial hygiene are outlined. Occupational diseases are in a large measure preventable and the degree of prevention exercised in a community will be reflected in the general health status of that community.

SKIN HAZARDS IN AMERICAN INDUSTRIES

The United States Public Health Service has recently issued the first of a series of publications dealing with skin hazards in American industries.[1] This first report includes candy making, synthetic dye

[1] Public Health Bulletin No. 215.

manufacture, oil refining, rubber industry, manufacture of linseed oil, and studies of outbreaks of dermatitis occurring among silk throwsters, insecticide manufacturers, and perfume bottlers.

Candy making.—In the candy industry over 1,200 workers in 4 factories were examined and the processes studied. The chief skin hazards were found to be burns in hard-candy making and dermatitis from flavoring oils and sugar. A case of hypersensitivity to chocolate is also described.

Synthetic dye manufacture.—In synthetic dye manufacture, 3,800 workers in 5 dye manufacturing establishments were examined. Processes of dye manufacture are described and the chief irritants are listed. It was found that most of the finished dyes are not irritants, but that many of the intermediates are powerful skin irritants. Methods of prevention are outlined.

Oil refining.—In the oil refining industry 8 refineries were included and about 14,000 men were examined. Processes of refining are described. An unusual number of papillomata of the skin was found among workers in this industry. Methods of prevention are outlined.

Rubber industry.—This study was based on investigations in 7 large rubber manufacturing companies employing about 30,000 workers. A brief review of literature on dermatitis in the industry is given, and the process of rubber manufact[illegible] is briefly described. The chief accelerators and antioxidants used are named. Dermatitis due to pure rubber is rare, but dermatitis caused by the compounds in rubber is fairly frequent. It is due not so much to the fact that these compounds are skin irritants as to the hypersensitivity of the workers to them. The workers compounding and handling the unvulcanized rubber are mostly affected. The cured rubber is seldom a cause of dermatitis. When it is, it is usually caused by "blooming out" of excess of accelerator or antioxidant. Preventive measures are outlined.

Linseed oil manufacture.—An outbreak of dermatitis in the manufacture of linseed oil is described. The chief irritants in this industry are as follows:

1. Irritation from the sharp points of the linseed itself.
2. Bites of parasites in the linseed.
3. Cuts from filter cloths made of human Chinese hair.
4. Hypersensitivity to the linseed oil itself.

Methods of prevention are given and literature on the subject is reviewed.

Dermatitis among silk throwsters.—The report describes an outbreak of dermatitis in a silk-throwing factory which was found to be due to the hypersensitivity of the handlers of wet silk to the wetting solu-

tion. This solution contained soap made of olive oil foots and anti-mildew, containing cresol.

Insecticide manufacture.—Investigation was made of an outbreak of dermatitis in an insecticide factory caused by petroleum distillate extracts of the Japanese daisy. Patch tests showed that the trouble was due to the irritating effects of pyrethrum, on which the insecticidal action of these flowers depends.

Perfume bottling.—An outbreak of dermatitis in a perfume bottling plant was found to be caused by essential oils containing a terpene alcohol, called "linalool."

DEATHS DURING WEEK ENDED FEB. 23, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Feb. 23, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	8,685	9,185
Deaths per 1,000 population, annual basis	12.1	12.8
Deaths under 1 year of age	582	602
Deaths under 1 year of age per 1,000 estimated live births	53	56
Deaths per 1,000 population, annual basis, first 8 weeks of year	12.9	12.7
Data from industrial insurance companies:		
Policies in force	67,351,397	67,553,818
Number of death claims	12,909	13,510
Death claims per 1,000 policies in force, annual rate	10.0	10.4
Death claims per 1,000 policies, first 8 weeks of year, annual rate	10.7	10.7

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Mar. 2, 1935, and Mar. 3, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 2, 1935, and Mar. 3, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar 2, 1935	Week ended Mar. 3, 1934	Week ended Mar. 2, 1935	Week ended Mar. 3, 1934	Week ended Mar. 2, 1935	Week ended Mar. 3, 1934	Week ended Mar. 2, 1935	Week ended Mar. 3, 1934
New England States:								
Maine	2		15	6	221	4	0	0
New Hampshire					30	206	0	0
Vermont	1				3	44	0	0
Massachusetts	17	9			531	2,375	1	1
Rhode Island	3	5			68	8	0	0
Connecticut	5	3	32	24	785	49	1	0
Middle Atlantic States:								
New York	34	53	[1] 20	[1] 32	2,111	1,175	14	4
New Jersey	30	18	28	28	842	472	3	0
Pennsylvania	63	65			4,620	3,823	9	0
East North Central States:								
Ohio	78	30	174	15	1,390	342	14	1
Indiana	38	20	115	103	528	807	9	1
Illinois	44	39	71	66	2,802	1,139	20	9
Michigan	6	13	17	2	2,314	73	2	1
Wisconsin	1	6	196	98	2,141	1,136	0	5
West North Central States:								
Minnesota	2	8	41		2,452	227	3	1
Iowa	10	8	99	3	1,481	187	1	1
Missouri	40	37	355	153	662	990	10	1
North Dakota	2	3	9	55	49	321	3	0
South Dakota	2	2		4	14	340	0	1
Nebraska	8	23		6	468	239	2	0
Kansas	19	15	20	5	1,552	246	3	1
South Atlantic States:								
Delaware	2	1		1	5	123	0	0
Maryland [2]	9	12	53	15	62	735	4	0
District of Columbia	25	7	3	1	13	514	6	0
Virginia	14	23			916	940	1	2
West Virginia	16	24	236	118	448	73	1	1
North Carolina	19	27	174	80	787	2,421	2	0
South Carolina	3	16	534	799	72	532	7	0
Georgia [3]	8	14	304			1,917	0	0
Florida [3]	4	5	49	2	102	111	2	1
East South Central States:								
Kentucky	15	17	117	44	1,001	269	2	1
Tennessee	12	10	175	215	41	1,411	6	2
Alabama	15	31	889	171	463	872	2	0
Mississippi [2]	2	5					0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 2, 1935, and Mar. 3, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 2, 1935	Week ended Mar. 3, 1934	Week ended Mar. 2, 1935	Week ended Mar. 3, 1934	Week ended Mar. 2, 1935	Week ended Mar. 3, 1934	Week ended Mar. 2, 1935	Week ended Mar. 3, 1934
West South Central States:								
Arkansas	3	7	113	50	58	561	2	1
Louisiana	23	28	37	18	131	159	1	0
Oklahoma [4]	12	18	244	131	54	625	2	3
Texas	56	114	897	902	187	2,312	10	2
Mountain States:								
Montana	5	8	320	25	180	12	8	1
Idaho		4	1		82	33	0	0
Wyoming					104	51	1	1
Colorado	13	8			736	188	1	0
New Mexico	8	7	30	2	15	118	1	1
Arizona	1	1	38	16	26	39	1	0
Utah [2]					12	711	0	1
Pacific States:								
Washington	3	2	1		132	189	0	0
Oregon	2		109	91	116	117	0	1
California	46	33	202	60	564	1,570	4	2
Total	730	769	5,727	3,341	31,371	30,806	154	47

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 2, 1935	Week ended Mar. 3, 1934	Week ended Mar. 2, 1935	Week ended Mar. 3, 1934	Week ended Mar. 2, 1935	Week ended Mar. 3, 1934	Week ended Mar. 2, 1935	Week ended Mar. 3, 1934
New England States:								
Maine	0	0	21	20	0	0	2	2
New Hampshire	0	0	13	14	0	0	0	0
Vermont	0	0	18	7	0	0	1	0
Massachusetts	2	0	220	216	0	0	1	2
Rhode Island	0	0	12	15	0	0	0	0
Connecticut	0	0	67	53	0	0	2	1
Middle Atlantic States:								
New York	2	1	948	782	0	0	10	7
New Jersey	0	1	160	182	0	0	0	1
Pennsylvania	2	0	720	1,038	0	0	6	9
East North Central States:								
Ohio	1	1	1,282	749	0	1	5	2
Indiana	0	0	303	281	1	3	3	0
Illinois	1	1	1,199	701	4	3	6	6
Michigan	0	1	408	786	0	0	0	7
Wisconsin	0	0	572	308	15	26	0	1
West North Central States:								
Minnesota	0	0	140	45	14	8	0	0
Iowa	1	0	73	78	4	12	4	1
Missouri	0	1	93	71	3	0	2	1
North Dakota	0	0	63	24	0	0	0	0
South Dakota	0	1	8	13	3	3	1	0
Nebraska	3	1	36	30	30	0	0	1
Kansas	1	0	95	106	6	2	0	4
South Atlantic States:								
Delaware	0	0	26	19	0	0	0	0
Maryland [3]	1	0	93	91	0	0	3	1
District of Columbia	0	0	55	16	0	0	0	1
Virginia	0	0	50	46	0	0	9	2
West Virginia	0	0	125	81	0	2	3	3
North Carolina	1	0	37	53	0	2	1	0
South Carolina	0	0	2	13	0	5	1	1
Georgia [3]	0	0	4	7	0	0	3	4
Florida [3]	1	2	4	4	0	0	2	0
East South Central States:								
Kentucky	0	0	52	56	0	0	3	1
Tennessee	0	1	28	31	0	0	1	4
Alabama	1	0	10	11	0	5	3	2
Mississippi [2]	0	0	12	25	3	0	3	0

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 2, 1935, and Mar. 3, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 2, 1935	Week ended Mar. 3, 1934	Week ended Mar. 2, 1935	Week ended Mar. 3, 1934	Week ended Mar. 2, 1935	Week ended Mar. 3, 1934	Week ended Mar. 2, 1935	Week ended Mar. 3, 1934
West South Central States:								
Arkansas	0	5	8	9	1	1	0	1
Louisiana	2	1	12	25	2	1	7	11
Oklahoma [4]	0	0	39	18	1	12	2	3
Texas	1	0	82	146	7	18	7	16
Mountain States:								
Montana	0	0	8	20	7	0	1	0
Idaho	0	0	4	15	0	5	0	1
Wyoming	0	0	9	8	2	0	0	0
Colorado	0	0	314	72	0	11	8	5
New Mexico	1	0	13	20	1	1	7	3
Arizona	0	0	10	11	0	0	0	0
Utah [2]	0	0	92	4	0	0	0	0
Pacific States:								
Washington	1	0	65	72	11	4	1	2
Oregon	0	0	49	39	0	0	1	0
California	11	4	303	234	1	1	2	3
Total	33	21	7,961	6,660	125	135	111	109

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Mar. 2, 1935, 2 cases, as follows: Georgia, 1; Florida, 1.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January 1935										
Arizona	8	7	815	-------	124	-------	1	202	0	3
Mississippi	3	41	11,280	1,038	156	121	0	89	2	13
Missouri	24	185	1,780	13	1,340	-------	0	345	8	28
New York	19	214	-------	8	3,814	-------	8	2,813	0	32
Puerto Rico	-------	60	84	1,614	84	-------	8	1	0	12
Virginia	17	115	6,581	1	1,850	5	1	271	6	24
Washington	5	13	301	-------	468	-------	7	264	338	10
Wisconsin	13	15	781	-------	3,281	-------	2	2,645	76	9

January 1935

	Cases
Chicken pox:	
Arizona	84
Mississippi	636
Missouri	455
New York	3,375
Puerto Rico	69
Virginia	397
Washington	638
Wisconsin	2,480
Diarrhea and dysentery (bacillary):	
Virginia	29
Dysentery:	
Arizona	7
Mississippi (amoebic)	57
Missouri	4
New York (amoebic)	3

January 1935—Continued

	Cases
Dysentery—Continued.	
New York (bacillary)	27
Puerto Rico	38
Virginia (amoebic)	1
Wisconsin (amoebic)	1
Epidemic encephalitis:	
Missouri	
New York	14
Washington	2
Wisconsin	2
Filariasis:	
Puerto Rico	1
German measles:	
Arizona	56
New York	1,587
Washington	362
Wisconsin	1,310

January 1935—Continued

	Cases
Hookworm disease:	
Mississippi	185
Leprosy:	
Puerto Rico	1
Mumps:	
Arizona	55
Mississippi	496
Missouri	274
Puerto Rico	71
Virginia	117
Washington	286
Wisconsin	1,046
Ophthalmia neonatorum:	
New York	13
Puerto Rico	3
Virginia	3
Washington	1

January 1935—Continued

	Cases
Paratyphoid fever:	
New York	4
Puerperal septicemia:	
Mississippi	25
Puerto Rico	4
Rabies in animals:	
Mississippi	10
Missouri	7
New York [1]	2
Washington	4
Rocky Mountain spotted fever:	
Virginia	1
Septic sore throat:	
Arizona	2
Missouri	29
New York	31
Virginia	10
Washington	2
Wisconsin	10

January 1935—Continued

	Cases
Tetanus:	
New York	4
Puerto Rico	5
Virginia	1
Tetanus, infantile:	
Puerto Rico	9
Trachoma:	
Arizona	32
Missouri	23
Virginia	1
Wisconsin	2
Trichinosis:	
New York	35
Tularaemia:	
Missouri	18
New York	4
Virginia	8
Washington	1
Wisconsin	2
Typhus fever:	
Virginia	1

January 1935—Continued

	Cases
Undulant fever:	
Missouri	2
New York	2
Virginia	1
Washington	1
Wisconsin	4
Vincent's infection:	
New York [1]	110
Washington	1
Whooping cough:	
Arizona	130
Mississippi	684
Missouri	282
New York	3,340
Puerto Rico	364
Virginia	540
Washington	80
Wisconsin	802
Yaws:	
Puerto Rico	11

WEEKLY REPORTS FROM CITIES

City reports for week ended Feb. 23, 1935

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	1	------	0	5	1	0	0	0	4	28
New Hampshire:											
Concord	------	------	------	------	------	------	------	------	------	------	------
Nashua	0	------	------	0	------	0	0	------	0	0	------
Vermont:											
Barre	0	------	0	0	0	0	0	0	0	0	2
Burlington	0	------	0	15	0	2	0	0	0	0	7
Massachusetts:											
Boston	7	------	3	11	0	35	0	11	0	23	261
Fall River	0	------	0	139	3	1	0	0	0	21	29
Springfield	0	------	0	62	1	11	0	0	0	2	31
Worcester	0	------	0	7	3	13	0	1	0	11	42
Rhode Island:											
Pawtucket	0	------	0	0	0	0	0	0	0	0	23
Providence	1	------	1	22	6	11	0	2	0	2	60
Connecticut:											
Bridgeport	0	1	1	1	5	14	0	1	0	1	32
Hartford	0	------	0	117	3	2	0	2	0	6	33
New Haven	0	4	1	119	5	0	0	1	0	0	45
New York:											
Buffalo	0	------	0	0	15	50	0	11	0	39	112
New York	36	27	13	441	172	439	0	64	1	184	1,479
Rochester	0	------	0	237	7	20	0	1	0	15	71
Syracuse	0	------	2	43	3	9	0	0	0	11	32
New Jersey:											
Camden	8	4	4	0	1	5	0	1	0	2	41
Newark	1	9	0	166	15	22	0	5	0	51	102
Trenton	0	2	1	26	6	11	0	3	0	2	49
Pennsylvania:											
Philadelphia	6	10	3	11	59	69	0	26	0	96	550
Pittsburgh	9	13	9	413	33	28	0	5	0	19	176
Reading	0	------	0	20	0	10	0	0	0	3	27
Scranton	1	------	------	294	------	2	0	------	0	2	------
Ohio:											
Cincinnati	4	------	3	1	15	20	0	4	0	5	148
Cleveland	9	83	3	155	19	29	0	10	0	56	180
Columbus	3	2	2	85	11	34	0	6	0	5	91
Toledo	0	2	1	32	7	28	0	5	0	7	84
Indiana:											
Fort Wayne	1	------	0	7	6	7	0	1	0	0	24
Indianapolis	9	------	1	19	15	16	0	1	0	12	------
South Bend	0	------	0	9	2	4	0	0	0	1	26
Terre Haute	1	------	1	0	1	0	0	1	0	0	24
Illinois:											
Chicago	13	6	6	842	54	593	0	41	0	108	708
Springfield	0	1	0	9	4	7	0	1	0	0	21

[1] Exclusive of New York City.

City reports for week ended Feb. 23, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Michigan:											
Detroit	3	16	5	377	51	130	0	21	0	69	326
Flint	1	------	0	216	5	8	0	2	0	1	23
Grand Rapids	0	------	0	51	3	6	0	1	0	15	38
Wisconsin:											
Kenosha	0	------	0	315	1	34	0	0	0	2	4
Milwaukee	1	1	1	402	7	245	0	6	0	27	108
Racine	0	------	2	41	1	2	0	0	0	3	16
Superior	0	------	0	153	1	1	0	1	0	5	10
Minnesota:											
Duluth	0	------	0	297	8	1	0	0	0	0	21
Minneapolis	1	------	0	1,066	4	40	0	1	0	17	85
St. Paul	1	------	0	9	6	28	1	3	0	12	67
Iowa:											
Davenport	0	------	------	3	------	3	0	------	0	0	------
Des Moines	0	------	------	48	------	4	0	------	0	0	35
Sioux City	0	------	------	4	------	0	0	------	0	1	------
Waterloo	4	------	------	4	------	3	4	------	0	0	------
Missouri:											
Kansas City	2	------	0	143	19	27	0	6	0	4	121
St. Joseph	0	------	0	14	11	2	0	3	0	2	47
St. Louis	11	3	1	13	21	25	0	9	0	8	188
North Dakota:											
Fargo	0	------	0	------	2	3	0	0	0	0	7
Grand Forks	0	------	------	------	------	2	0	------	0	0	------
South Dakota:											
Aberdeen	0	------	------	2	------	2	0	1	0	0	------
Sioux Falls	0	------	------	0	------	0	0	------	0	0	6
Nebraska:											
Omaha	7	------	0	47	2	15	0	3	0	2	61
Kansas:											
Topeka	0	------	2	26	8	2	0	1	0	4	43
Wichita	1	------	1	175	6	1	0	2	0	0	31
Delaware:											
Wilmington	0	------	0	------	5	5	1	3	0	0	33
Maryland:											
Baltimore	4	6	2	7	31	56	0	9	1	17	249
Cumberland	0	------	0	7	0	0	0	1	0	0	14
Frederick	0	------	0	0	0	0	0	0	0	1	6
District of Columbia:											
Washington	8	7	4	11	22	44	0	10	2	2	207
Virginia:											
Lynchburg	2	------	2	321	2	3	0	0	0	10	16
Norfolk	0	8	0	14	9	5	0	2	0	7	36
Richmond	0	------	3	81	10	1	0	7	0	0	73
Roanoke	2	------	0	23	2	5	0	0	0	0	17
West Virginia:											
Charleston	0	------	0	19	1	1	0	0	0	6	12
Huntington	1	------	------	22	------	6	0	------	0	0	------
Wheeling	0	------	2	57	2	10	0	2	0	5	24
North Carolina:											
Raleigh	------	------	------	------	------	------	------	------	------	------	------
Wilmington	0	------	0	0	4	0	0	1	0	0	15
Winston-Salem	0	2	1	17	1	2	0	2	0	25	18
South Carolina:											
Charleston	0	40	1	1	6	2	0	3	0	0	27
Columbia	------	------	------	------	------	------	------	------	------	------	------
Greenville	0	------	0	0	3	0	0	1	0	0	15
Georgia:											
Atlanta	4	44	2	2	16	11	0	5	0	8	93
Brunswick	0	------	0	0	0	0	0	0	0	0	1
Savannah	0	42	1	2	3	0	0	0	0	3	30
Florida:											
Miami	2	8	2	1	3	0	0	1	0	0	36
Tampa	8	3	3	2	3	1	0	1	0	0	28
Kentucky:											
Ashland	1	------	0	3	0	3	0	1	0	0	------
Lexington	0	15	0	1	5	0	0	1	0	2	19
Louisville	4	5	1	215	8	19	0	4	1	13	69
Tennessee:											
Memphis	5	------	0	0	18	6	0	7	0	8	90
Nashville	0	------	2	0	8	4	0	3	1	2	60
Alabama:											
Birmingham	2	66	2	29	5	5	0	4	1	11	71
Mobile	0	12	2	0	4	1	0	2	0	0	30
Montgomery	0	------	------	23	------	2	0	------	0	0	------

City reports for week ended Feb. 23, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Arkansas:											
Fort Smith											
Little Rock	1		1	17	5	2	0	6	0	0	13
Louisiana:											
New Orleans	26	11	3	18	22	11	0	0	0	0	157
Shreveport	1		0	4	15	0	0	6	0	3	66
Oklahoma:											
Tulsa	2			2		1	0		0	14	
Texas:											
Dallas	8	7	7	0	11	5	0	2	0	0	66
Fort Worth	1		1	0	7	2	0	0	0	0	32
Galveston	9		0	0	1	1	0	1	0	0	19
Houston	5		4	3	8	2	0	12	1	0	74
San Antonio	1		6	0	7	5	0	7	0	0	71
Montana:											
Billings	0		0	0	0	0	0	0	0	0	12
Great Falls	0		0		4	1	0	0	1	0	13
Helena	0		0	73	0	0	0	0	0	0	4
Missoula	0		0	26	0	0	0	0	0	6	4
Idaho:											
Boise	0		0	1	0	1	0	0	0	0	14
Colorado:											
Denver	5	39	5	343	8	242	0	3	0	5	98
Pueblo											
New Mexico:											
Albuquerque	2		0	6	4	2	0	6	0	10	20
Utah:											
Salt Lake City	0		1	8	2	80	0	1	0	48	31
Nevada:											
Reno	0		0	0	1	0	0	0	0	0	6
Washington:											
Seattle	0			33		6	3		0	7	
Spokane	0	1	1	131	4	4	0	0	0	8	32
Tacoma											
Oregon:											
Portland	0	2	0	44	6	9	0	2	0	0	84
California:											
Los Angeles	11	68	2	16	18	50	7	20	0	8	306
Sacramento	12		0	13	0	9	0	2	1	0	22
San Francisco	0	6	2	10	13	20	0	12	0	10	170

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts:			
Boston	0	1	0
Fall River	1	1	0
Rhode Island:			
Providence	1	0	0
Connecticut:			
Bridgeport	1	1	0
New York:			
New York	3	0	0
New Jersey:			
Newark	1	0	0
Pennsylvania:			
Pittsburgh	1	0	0
Ohio:			
Cincinnati	15	2	0
Illinois:			
Chicago	10	4	0
Wisconsin:			
Milwaukee	1	0	0
Iowa:			
Des Moines	2	0	0
Waterloo	0	0	1
Missouri:			
Kansas City	1	1	0
St. Joseph	1	1	0
St. Louis	1	0	0
Nebraska:			
Omaha	3	0	0
Kansas:			
Wichita	2	2	0
Maryland:			
Baltimore	4	2	0
District of Columbia:			
Washington	11	2	1
Florida:			
Tampa	0	0	1
Kentucky:			
Lexington	1	0	0
Alabama:			
Birmingham	1	0	0
Mobile	0	1	0
Montgomery	1	0	0
Arkansas:			
Little Rock	2	0	0
Texas:			
Dallas	2	1	0
Houston	1	0	0
Colorado:			
Denver	2	1	0
New Mexico:			
Albuquerque	1	2	0
California:			
Los Angeles	0	0	5
San Francisco	1	0	0

Epidemic encephalitis.—Cases: Philadelphia, 1; Milwaukee, 1.
Pellagra.—Cases: Charleston, S. C., 1; Miami, 2; Atlanta, 2; Savannah, 4; New Orleans, 2.
Typhus fever.—Cases: Savannah, 1; Tampa, 2.

FOREIGN AND INSULAR

ALASKA

Poliomyelitis.—On March 3, 1935, an outbreak of poliomyelitis was reported at Unga and Sandpoint, Alaska.

CANADA

Provinces—Communicable diseases—2 weeks ended February 9, 1935.—During the 2 weeks ended February 9, 1935, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis					2	1				3
Chicken pox		3	1	406	744	70	191	20	112	1,547
Diphtheria		7		38	10	13	4		2	74
Dysentery				3					3	6
Erysipelas				14	4	3	12	1		34
Influenza		4		18	292	1	3		153	471
Lethargic encephalitis					1			1		2
Measles		263	8	805	1,831	369	1,133	11	123	4,598
Mumps		102	1		466	50	3	7	38	667
Paratyphoid fever					1					1
Pneumonia		2			88		10		46	96
Poliomyelitis					2					2
Scarlet fever	4	14	2	269	305	43	26	25	43	731
Smallpox					1					1
Tuberculosis	2	1	10	138	65	15	18	4	27	280
Typhoid fever			2	20	7	1	1			31
Undulant fever				1	2					3
Whooping cough		5	2	248	357	40	60	16	160	888

CUBA

Habana—Communicable diseases—4 weeks ended February 16, 1935.—During the 4 weeks ended February 16, 1935, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	2		Tuberculosis	29	9
Diphtheria	4	3	Typhoid fever	[1] 8	3
Malaria	[1] 23	5			

[1] Includes imported cases.

Provinces—Notifiable diseases—4 weeks ended February 9, 1935.—During the 4 weeks ended February 9, 1935, cases of certain notifiable diseases were reported in the Provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	2			1			3
Chicken pox					2		2
Diphtheria		2	3	3	2		10
Hookworm disease				2			2
Leprosy				3		11	14
Malaria	352	14	2,043	1,379	410	795	4,993
Measles		16		15	1		32
Poliomyelitis	1	1	1	1	1		5
Scarlet fever		4			1		5
Tuberculosis	3	4	60	37	12	32	148
Typhoid fever	1	2	5	14	6	12	40

JAMAICA

Communicable diseases—4 weeks ended January 26, 1935.—During the 4 weeks ended January 26, 1935, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox	1	10	Leprosy	1	4
Diphtheria	1		Puerperal fever		6
Dysentery	9	6	Tuberculosis	30	70
Erysipelas		2	Typhoid fever	11	65

PUERTO RICO

Notifiable diseases—4 weeks ended February 23, 1935.—During the 4 weeks ended February 23, 1935, cases of certain notifiable diseases were reported in the municipalities of Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chicken pox	115	Poliomyelitis	1
Diphtheria	54	Ringworm	3
Dysentery	20	Scarlet fever	1
Erysipelas	2	Syphilis	9
Influenza	62	Tetanus	4
Malaria	1,128	Tetanus, infantile	1
Measles	46	Trachoma	1
Mumps	66	Tuberculosis	664
Ophthalmia neonatorum	5	Typhoid fever	10
Pellagra	2	Whooping cough	174

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Feb. 22, 1935, pp. 267–279. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Mar. 29, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Plague

Argentina—Santa Fe.—During the month of February 1935, one case of plague was reported at Santa Fe, Argentina.

China—Manchuria.—A report dated January 29, 1935, states that up to January 23, 1935, 78 deaths from pneumonic plague occurred near Kangping, Fengtien Province, Manchuria, and that up to January 21, 1935, 50 deaths from this disease had occurred in 6 villages of the Pe Wang Fu district, several miles northwest of Kangping.

Smallpox

Egypt—Dakahliya Province.—During the week ended February 2, 1935, 56 cases of smallpox with 3 deaths were reported in Dakahliya Province, Egypt.

Typhus fever

Straits Settlements—Singapore.—During the week ended January 5, 1935, one case of typhus fever was reported at Singapore, Straits Settlements.

Yellow fever

Ivory Coast.—During the week ended February 23, 1935, yellow fever was reported in Ivory Coast as follows: 1 case at Bobodiulasso, and 1 case at Ouagadougou.

UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg Gen. R. C. WILLIAMS, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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BACTERIAL PURIFICATION RATES IN POLLUTED WATER[1]

By J. K. HOSKINS, *Sanitary Engineer, United States Public Health Service*

Studies of the phenomena of natural purification in polluted streams have been pursued by the United States Public Health Service systematically and almost continuously since 1912. Beginning with the well-known fact that the general trend in polluted streams is toward purification, as evidenced by a decrease in bacterial count and various chemical changes, the purpose in view has been to determine more exactly the rates at which these changes take place in nature, to relate observed variations in the rates to determinate changes in such variables as temperature, the channel characteristics which determine velocity and turbulence of stream-flow, the abundance and character of the plankton, and similar conditions, in the hope of arriving eventually at a better understanding of the physical, chemical, and biological factors involved. The indices of pollution which have been found most useful for the measurement of natural purification are bacterial counts, qualitative and quantitative plankton counts, and determination of biological oxygen demand. These are closely interrelated; but in this discussion attention will be confined to changes in numbers of bacteria as indicated by plate counts on standard gelatine and agar media and quantitative fermentation-tube tests for organisms of the *coli-aerogenes* group.

The first stage of this study was an empirical determination of the extent of purification, as measured by the decrease in bacteria or oxygen demand, actually observed between two cross sections of a stream between which the times of flow corresponding to each river stage were known, choosing stretches within which no significant inflow of water or polluting matter occurred. River stretches especially suitable for such study are the Ohio River from Cincinnati to Louisville, the Illinois River from Lockport, Ill., where it receives the discharge of the Chicago Drainage Canal, to Peoria, Ill., and the

[1] From the Office of Stream Pollution Investigations, U. S. Public Health Service, Cincinnati, Ohio.

Lower Illinois River, from Peoria to Kampsville. In each of these river stretches the fresh sewage-pollution in the upper zone is heavy, and the distance to the lower end is over 100 miles, with times of flow ranging from 40 to over 300 hours. Extended observations of this nature have been made, covering widely different seasonal and weather conditions on the Ohio River during the years 1913–16 (*1*) and 1929-30 (*2*), on the Illinois River (*3*) in 1921–22, and on the upper Mississippi River (*4*). The results of these observations have been reported in detail in the publications referred to.

GENERAL OBSERVATIONS ON BACTERIAL PURIFICATION IN NATURAL STREAMS

The principal conclusions that may be drawn from these observations concerning the improvement in the bacterial content of the polluted water flowing in natural streams are as follows:

1. The general tendency is toward decrease in numbers of all bacteria which grow on the usual culture media, in all long river stretches free from added pollution. To this general statement there are, however, certain important exceptions, which are discussed hereafter.

2. The rate of decrease varies widely in different streams, in different stretches of the same stream, and even in the same stretch of stream at different times. The rates of decrease of the groups of bacteria represented respectively by the 20° gelatine count, the 37° agar count, and the *coli-aerogenes* group are not widely different.

3. So far as may be judged from decrease in turbidity due to suspended inorganic matter, sedimentation appears to be a minor factor in bringing about the observed bacterial decrease; and no evidence has been found indicating a measurable effect due to the direct action of sunlight.[3]

4. In any long stream stretch the *rate* of bacterial decrease is not constant but tends to diminish progressively as the pollution decreases in intensity. This condition is clearly illustrated by the data presented in table 1, plotted in figures 1 and 2, showing the bacteria remaining (in percent of the maximum) at successive sampling points in stretches of the Ohio and Illinois Rivers. The flattening of the curves in passing from the upper to the lower stations suggests that a residual bacterial content is eventually approached beyond which a further material decrease does not occur.

[3] The indirect effect of sunlight, exerted through its relation to the metabolism of chlorophyll-bearing plankton, may be very considerable.

TABLE 1.—*Coordinates of curves describing decrease in agar counts in relation to time of flow from zone of maximum pollution*

Time of flow from maximum zone in hours	Percentage of bacteria remaining: Summer season			Winter season		
	Ohio River [1] (maximum per cc, 99,300)	Upper Illinois [2] (maximum per cc, 3,420,000)	Lower Illinois [3] (maximum per cc, 254,000)	Ohio River [4] (maximum per cc, 3,500)	Upper Illinois [2] (maximum per cc, 142,000)	Lower Illinois [3] (maximum per cc, 9,440)
0	100	100	100	100	100	100
5		46.0	65.5		54.5	76.0
10	67.26	29.5	47.5	80	36.3	61.8
20	45.37	15.8	28.6	67	20.7	45.9
30	30.71	9.80	19.8	56	14.0	38.0
40	20.90	6.50	14.7	48	10.6	34.3
50	14.31	4.50	11.0	42	8.45	32.6
60	9.88	3.21	8.50	37	7.00	31.4
70	6.89	2.30	6.68	33	5.90	31.0
80	4.88	1.70	5.28	30	5.03	31.0
90	3.50	1.29	4.19	27.5	4.35	31.0
100	2.57	.99	3.34	25.3	3.78	
125	1.30	.51	1.90	21.3	2.62	
150	.76	.26			1.82	
175	.50	.14			1.27	
200	.36	.07				

[1] From Table 125, Pub. Health Bull. No. 143.
[2] From Table 70, Pub. Health Bull. No. 171.
[3] From Table 74, Pub. Health Bull. No. 171.
[4] From Table 128, Pub. Health Bull. No. 143.

5. In general, the rate of bacterial decrease in a given river stretch is lower in winter, when water temperatures are, say, under 10° C., than it is in spring, summer, or autumn. Differences between summer and winter rates are illustrated by comparison of the curves in figure 1 and figure 2, showing the summer and winter decreases, respectively, for the same stretches of the Ohio and Illinois Rivers. Between 10° C. and 30° C. there appears to be no very definite correlation between rates of bacterial decrease and temperature change, other factors perhaps clouding such slight relations as may exist.

6. The initial rate of bacterial purification has been found to be higher in river stretches where pollution is most intense. This is clearly shown by the accompanying summary of data from table 1. As the time from the source of maximum pollution increases, this difference in rate is less noticeable, however, and may entirely disappear.

	Summer season		Winter season	
	Concentration per cc	Percent remaining after 10 hours	Concentration per cc	Percent remaining after 10 hours
Upper Illinois	3,420,000	29.5	142,000	36.3
Lower Illinois	254,000	47.5	9,440	61.8
Ohio River	99,300	67.3	3,500	80.0

7. Observed exceptions to the general tendency of bacteria to decrease in flowing streams are noted as follows:

(*a*) In a *fresh* mixture of sewage and water the bacterial count (including the *coli-aerogenes* index) tends definitely to *increase* for a period varying from 8 to 24 hours, the stage of increase being quite regularly longer in winter than in summer. The increase is not very great, the maximum count being usually less than 200 percent of the

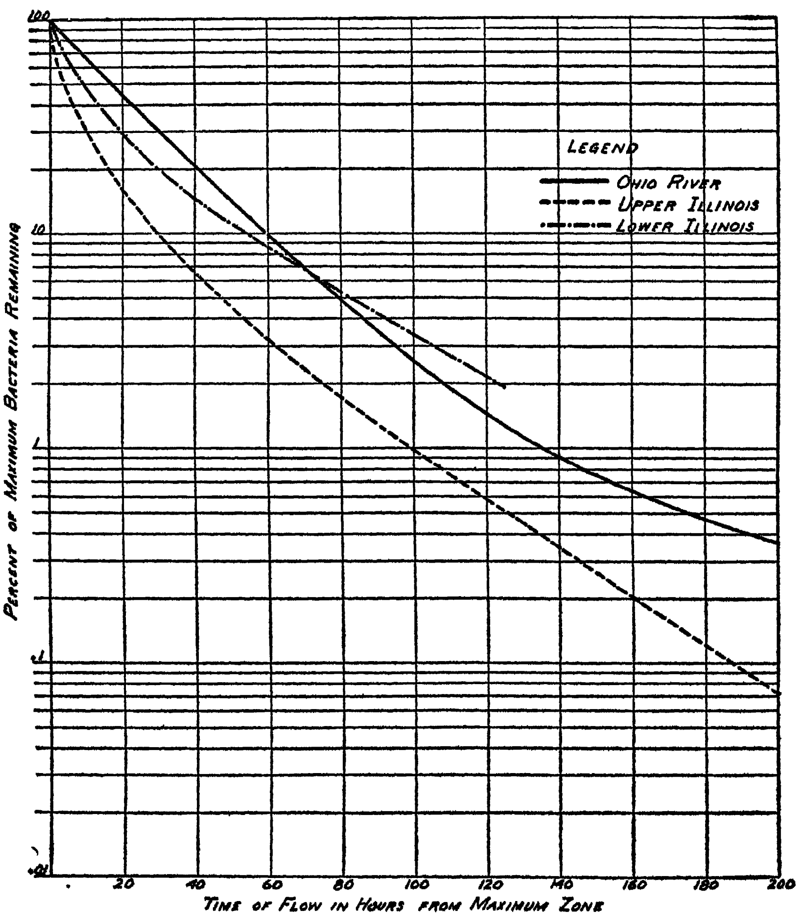

FIGURE 1.—Curves showing rates of decrease in bacteria in the Ohio and Illinois Rivers. Summer season. Agar counts 37° C, 24 hours

initial; but within this range the tendency toward increase rather than decrease is quite constant. This observation, first made in the Ohio River immediately below the sewer outlets of Cincinnati, was so utterly unexpected that it was at first attributed to a systematic sampling error resulting from imperfect admixtures at the upper sampling stations. More extended observations in this stretch and

elsewhere have demonstrated, however, that the increase is not explained by observational error. It may, perhaps, be due to the breaking up of clumps of bacteria, which would increase the bacterial count without actual increase in numbers of bacteria; but we are inclined to believe that it is brought about by actual multiplication of the bacteria present. Figure 3 shows, for the stretch of the Ohio River immediately below the sewer outfall of Cincinnati, the primary stage of initial increase as observed in winter and summer, respectively.

(*b*) A similar bacterial increase is sometimes observed when two streams of quite different pollutional density are merged, a phenomenon which has been discussed in a previous publication (*5*).

(*c*) Although the over-all general trend following this initial increase is toward a progressive decrease in bacterial numbers, a

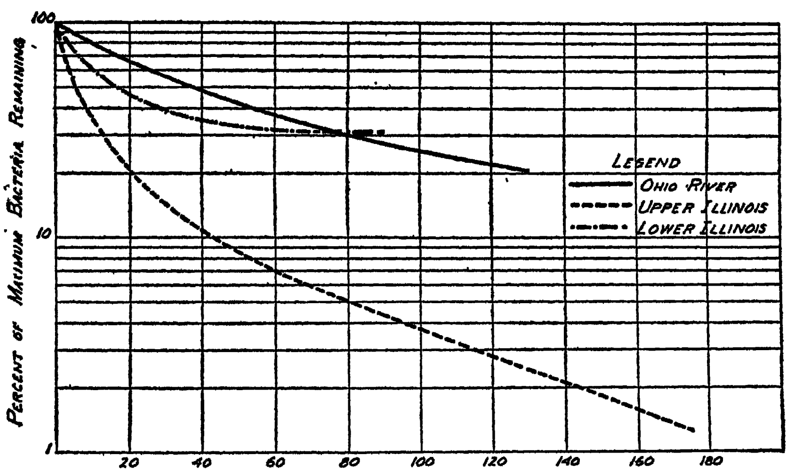

FIGURE 2.—Curves showing rates of decrease in bacteria in the Ohio and Illinois Rivers. Winter season. Agar counts 37° C., 24 hours.

more detailed examination of results reveals that frequently this trend is interrupted at intervals, and for short periods it may even be reversed. Such irregularities as occur are not constant as to location or extent, the deflections in the curves moving up or down stream from time to time without apparent cause. Figure 4 (reproduced from Public Health Bulletin No. 171), showing the actual observed numbers of bacteria at successive stations in the upper Illinois River during summer months, illustrates this point.

THE SIMULATION OF NATURAL STREAM PURIFICATION UNDER LABORATORY CONDITIONS

When observations on the Ohio River had shown the direction and extent of the bacterial purification taking place naturally in the

stream, attention was turned to reproducing these changes under controlled experimental conditions. The first stage in this study comprised a long series of observations on samples of polluted water from sampling stations in the Ohio River and other sources, the samples being stored in a variety of containers under varying conditions of temperature, light, agitation, and aeration. In one series of such experiments, in order to reproduce exactly the conditions of temperature and light obtaining in the river, containers were suspended in the stream itself. The results of these studies of stored samples, which have been reported in detail by Butterfield (*6*), show:

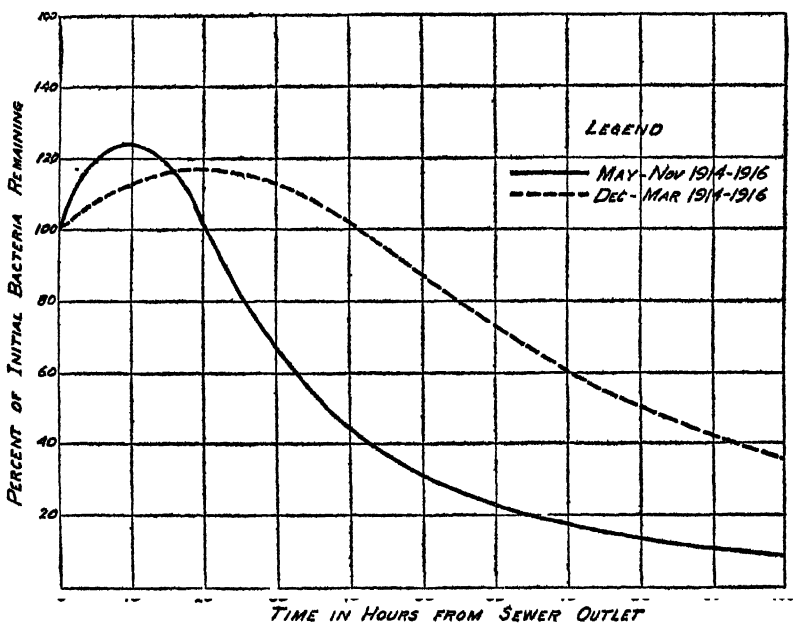

FIGURE 3.—Curves showing changes in bacterial density below sewer outlets of Cincinnati, Station 475, Ohio River. Agar counts at 37° C., 24 hours.

(*a*) In stored samples the first change was invariably a multiplication of the bacteria amounting to fourfold, twentyfold, or even fiftyfold, depending on the source and the temperature of storage. This increase, occurring regularly in samples collected from zones of the river in which the bacteria were rapidly diminishing, afforded definite evidence that in such zones the river water contained a food supply sufficient to support a much higher bacterial population than was actually present in the stream. It served also to demonstrate that the decrease observed in the stream could not be attributed to toxic chemical action.

(*b*) Following this initial increase in bacterial numbers to a well-defined maximum, the time to reach which was extended with lower

temperature of storage, there occurred an orderly progressive decrease, as in nature, resulting eventually in a number well below that of the initial sample. The rate of decrease was uniformly much lower than that observed in the river. However, in a recent critical analysis of these data, Streeter (7) has shown that, when allowance is made for the influence of sedimentation in the river, the rates of decrease in stored samples approach those observed in the river.

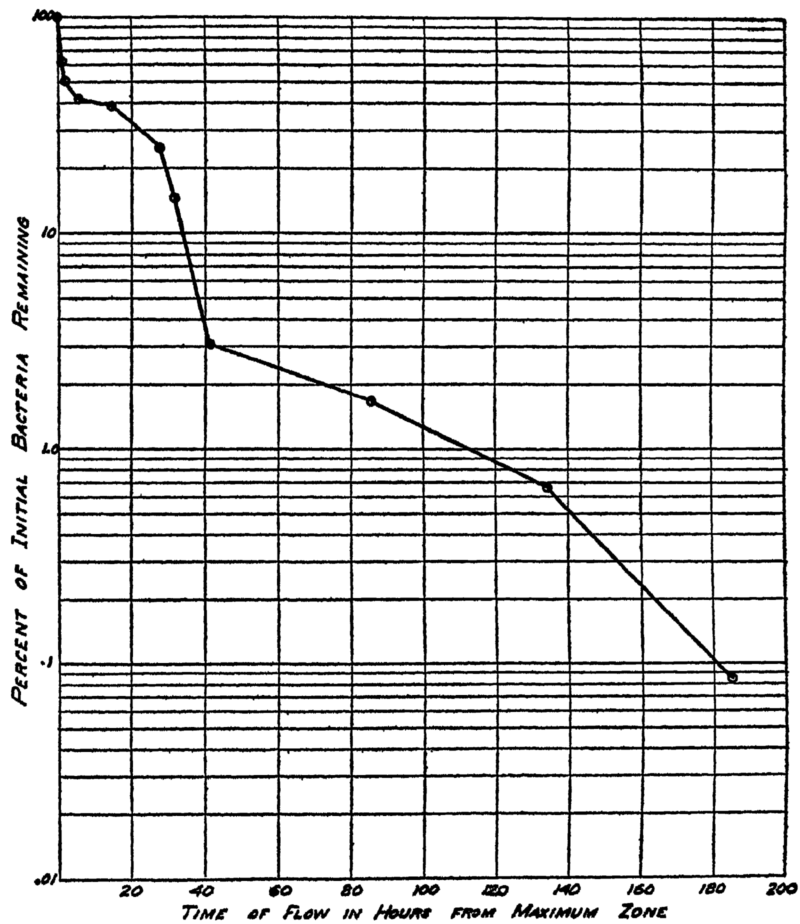

FIGURE 4.—Variation in rates of bacterial change actually observed from Station to Station in the upper Illinois River Summer season. Agar counts 37° C, 24 hours

RELATIONSHIP OF PLANKTON TO BACTERIA IN POLLUTED WATERS

In a study of the relation of plankton to the bacterial changes commonly observed in polluted waters, Purdy and Butterfield (8) carried out a series of experiments in which sterilized sewage was inoculated (*a*) with mixed cultures of sewage bacteria, no living

plankton being present; (*b*) with the same bacterial inoculum plus a culture of *paramoecium* or *colpidium;* and (*c*) with a small amount of unsterilized sewage, supplying the bacteria and protozoa found in nature. Their studies, extended later by Butterfield, Purdy, and Theriault (*9*), show:

(1) When no living protozoa are present, the bacteria multiply rapidly to a maximum, which is maintained at nearly the same level for several weeks or declines *very* slowly.

(2) When living protozoa are present, the bacteria increase at first to nearly the same maximum, then decrease rapidly to a much lower level, following a course similar to that observed in stored samples of unsterilized sewage or polluted river water.

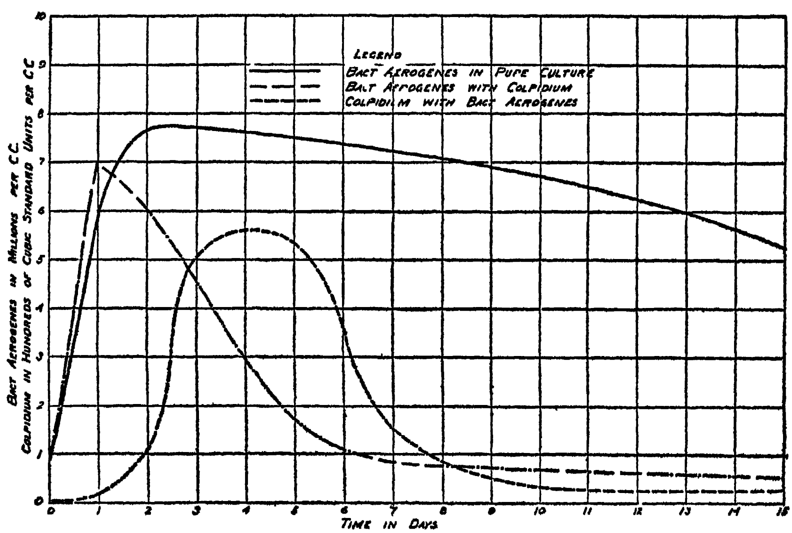

FIGURE 5.—Bacteria and Colpidium counts in dilute dextrose peptone solution, incubated at 20° C., when inoculated with (1) *Bact. aerogenes* in pure culture and (2) *Bact. aerogenes* and Colpidium growing together, each in pure culture. Average of 10 experiments.

(3) During the stage of rapid increase of bacteria, the protozoa likewise multiply rapidly to a maximum, which is reached after the bacterial maximum, and then decline at about the same rate as the bacteria.

(4) In long-continued experiments it happens not infrequently that after the decrease in protozoa has set in, the bacterial count shows a secondary increase, followed in turn by a subsequent decline.

Figure 5 (reproduced from Butterfield, Purdy, and Theriault (*9*)) illustrates the characteristic difference of bacterial history in the presence and in the absence of protozoa.

It thus seems well established that the rapid decrease in bacteria characteristically observed in polluted waters is due primarily not to

lack of adequate food supply, the action of toxic substances, removal by sedimentation, or injury by sunlight, but to destruction by predatory plankton, which are dependent upon living bacteria for their food supply. There is, indeed, much evidence that even in the presence of predatory plankton the sewage bacteria in polluted waters are continuously multiplying at a quite rapid rate, and that their observed rate of decrease is actually the net difference between birth rate and death rate, foraging plankton being chiefly responsible for the latter.

From this viewpoint, any disturbance of the existing balance between plankton and bacteria would influence the rate of bacterial change (either decrease or multiplication) in polluted water. Thus the reversal in direction of change observed regularly in stored samples as compared with natural streams may be regarded as the reflection of some such disturbance of the biological balance in the stored sample, a disturbance which limits the activities of the plankton rather than of the bacteria. In the same way, the mixture of two streams of widely different degrees of pollution would create a sudden change in environmental conditions to which the plankton would require some time to become accustomed, the bacteria in the meantime continuing to multiply.

ARTIFICIAL CHANNEL EXPERIMENTS

In an effort to provide an experimental set-up in which a biologica balance could be maintained more nearly comparable with that existing in natural streams, a system of artificial water channels was constructed on the station grounds in 1926 and has been operated at intervals since that time.

As originally constructed, the channels consisted of a series of 48 galvanized iron troughs, each 90 feet long, 2 inches wide, and 6 inches deep, the interior well covered with carbon paint to avoid contact of the water with metal, arranged in tiers and at an adjustable gradient that would permit gravity flow throughout the system at various desired velocities. Connections between successive troughs were made by short sections of rubber hose 1 inch in diameter, the outlet ends of which were adjustable in elevation to control the depth of flow. Each tier of troughs was covered with a narrow roof, but the sides were exposed to admit light. Later the entire system was housed under a glass cover to eliminate interruptions in operation caused by freezing temperatures, heat sufficient for this purpose being provided by gas-burning units.

The water passed through the channels was delivered from the Ohio River by a pump installed originally to serve an experimental filtration plant. The volumes delivered to the channels were regulated

by the use of fixed, calibrated orifices under constant head. For studying the rates of purification of the water flowing in the channels, the average velocity of flow through the system under varying conditions was determined. Sampling stations for the experimental work were then located at successive points along the troughs corresponding to fixed periods of time of flow from the inlet.

EXPERIMENTS WITH RAW OHIO RIVER WATER

In the first group of experiments, raw Ohio River water passed through the channel system continuously during week days but stood motionless in the various troughs over the week-ends. For some of these test runs, water was added at the rate of 0.5 gallon per minute, giving a velocity of 1.09 feet per minute, corresponding to a total time of passage through the system of 66 hours. For other tests, the rate of flow was increased to a velocity of 1.56 feet per minute, equivalent to a total time of passage of 46 hours. This was found to be a more suitable rate and was maintained in later experiments.

The 14 experiments comprising the first series may be combined into 3 groups, in which the experimental conditions were as follows:

Series	Date, 1926-27	Rate of flow, feet per minute	Observed temperature of water, °C.		
			Maximum	Minimum	Average
1 to 8	August 16 to October 9	1.09	26.6	8.8	20.6
9 to 11	October 18 to November 6	1.56	16.7	1.9	8.1
12 to 14	November 8 to May 27	1.56	21.3	.8	12.0

The average initial bacterial count (on agar at 37° C. or 20° C., 24 hours) in each group of experiments is shown in table 2. The counts varied, of course, from day to day, but not excessively, 75 percent or more of the samples collected at the inlet of the channels showing between 5,000 and 20,000 bacteria per cubic centimeter.

The average course of bacterial change for each of these three groups of experiments is presented in table 2 in the form of percentages of the initial numbers of bacteria remaining after successive times of flow.

These results disclose a generally consistent reduction in bacteria as the water passed through the channel system, and particularly an absence of the initial rise in contrast with that always obtained in the stored samples. The reduction in bacterial numbers was somewhat more rapid in the later series, after the velocity of flow had been increased and after heavier biological growths had developed on the channel-wetted surfaces. Although these observed rates of decrease are by no means uniform, but on the contrary are inter-

mittent, nevertheless the ultimate tendency is toward a gradual reduction in bacterial numbers. If smooth curves are drawn, by observation, through the plotted points, a rough comparison is afforded between the average purification rates observed in these experiments and those observed in the Ohio River. The curves for this comparison are shown in figure 6.

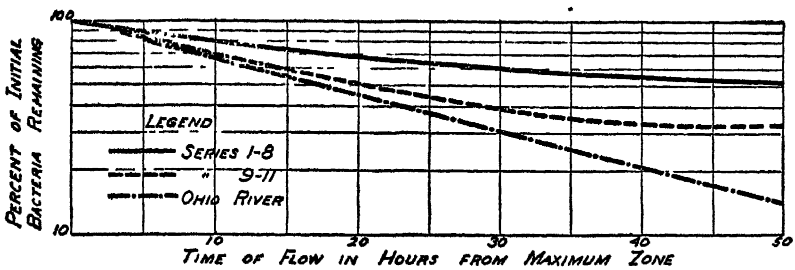

FIGURE 6.—Comparison of rates of bacterial change in Ohio River water flowing in the experimental channels with those observed in the river itself below Cincinnati. Summer season. Agar counts 37° C., 24 hours.

TABLE 2.—*Raw Ohio River water—Percentage of initial bacteria remaining after stated times of flow through channels*

Flow time, hours	Series 1 to 8 0.5 gallon per minute — 37° C. agar plate counts. Influent content=13,500 per cc=100 percent	Series 9 to 11 0.75 gallon per minute — 37° C. agar plate counts. Influent content=9,920 per cc=100 percent	Series 12 to 14 0.75 gallon per minute — 20° C. agar counts. Influent content=13,500 per cc=100 percent	Flow time, hours	Series 1 to 8 0.5 gallon per minute — 37° C. agar plate counts. Influent content=13,800 per cc=100 percent	Series 9 to 11 0.75 gallon per minute — 37° C. agar plate counts. Influent content=9,920 per cc=100 percent	Series 12 to 14 0.75 gallon per minute — 20° C. agar counts. Influent content=13,500 per cc=100 percent
0	100	100	100	26	63.3	48.6	37.6
2	97.0	96.0	83.0	28	66.8	43.0	41.9
4	80.2	93.1	76.2	30	64.9	32.1	39.7
6	96.4	90.2	78.5	42	40.8	-----	41.0
10	-----	-----	72.7	44	58.7	34.5	55.0
12	-----	-----	58.9	46	53.0	34.0	48.3
14	-----	-----	60.4	48	51.5	-----	-----
18	73.9	53.7	58.2	50	48.0	-----	-----
20	70.7	51.3	49.0	52	50.0	-----	-----
22	63.1	50.7	53.4	54	44.2	-----	-----
24	65.0	45.8	47.3	66	43.5	-----	-----

Although the rates of purification in the channels are much lower than those of the Ohio River below Cincinnati, as shown on the plot, it is to be noted that the channel water was much less polluted than the river below Cincinnati. However, in the stretch of Ohio River from Portsmouth, Ohio, to above Cincinnati, where at the upper station the bacterial density was 1,450 per cc (during the summer of 1914), a decrease of 46 percent took place in a time of flow period averaging 67.9 hours—a considerably slower rate of decrease than that occurring in the channels.

EXPERIMENTS WITH MIXTURES OF SEWAGE AND OHIO RIVER WATER

A further series of experiments was next undertaken in which graded changes were made in the initial concentration of bacteria in the influent channel water, in order to simulate more closely the pollution range of the Ohio River below Cincinnati, as well as to check the relation between purification rate and bacterial density. These higher bacterial densities in the channel water were obtained by mixing with the Ohio River water varying amounts of domestic sewage previously stored for 12 hours or more in a storage tank, in order to remove gross suspended matter and to obtain a more stable mixture. Operating data of this series of experiments are given in table 3.

The results of these experiments, presented in table 4, indicate that the rates of purification are by no means uniform or regular from beginning to end of the flowing-through period. They are consistent to the extent that all show a decline in numbers of bacteria; and although apparent increases occur at times, in no case does the increase exceed the initial density. Generally the most rapid decrease was observed in the first few hours, with secondary increases thereafter. Furthermore, there appears to be no orderly relation between rates of decrease and initial bacterial concentration within the fairly narrow range of variation represented. There was, however, a quite definite tendency for higher purification in the later of the series of experiments which may be ascribed in part at least to the building up of a more active biological "carpet" in the channels as the season advanced. In general the tendency was for a fairly rapid decline to a minimum, followed thereafter by oscillations up and down around this level. These oscillations were irregular from day to day in that the zone of decline one day, for example, might have changed to a zone of increase the next. The oscillations probably represent the continuous effort of the plankton and bacteria to reach an eventual stable balance. It seems fair to conclude that, under the conditions of these experiments at least, the bacterial reduction is not a continuous and regular process, but is the resultant of more or less periodic fluctuations around a trend generally tending to lower numbers of those species which grow on ordinary culture media.

TABLE 3.—*Characteristics of series of experiments with mixtures of sewage and Ohio River water*

[Velocity of flow 1.56 feet per minute]

Experiment no.	Date, 1927	Number of days	Percent sewage concentration	Temperature, ° C.						Bacteria per cc, agar, 37° C., 24 hours		Maximum bacterial reduction	
				Of water			Of air						
				Average	Maximum	Minimum	Average	Maximum	Minimum	Initial	Minimum	Percent	Hour reached
15	May 31 to July 23	53	5	20.8	29.0	12.0	20.6	35.6	11.1	111,000	35,300	31.8	46
16	August 1 to August 13	13	15	21.0	27.5	15.5	17.8	32.2	12.2	150,000	33,600	22.4	4
17	August 14 to August 26	14	30	22.2	25.0	14.0	16.1	28.9	8.9	550,000	149,000	27.1	11
18	August 28 to September 9	13	45	25.4	28.0	17.0	18.3	32.2	12.2	1,490,000	442,000	29.7	16
19	September 10 to September 24.	14	30	20.4	23.6	8.0	16.7	25.6	4.4	876,000	91,200	10.4	33
20	September 25 to October 8	14	15	19.9	25.0	12.0	16.7	30.0	6.7	136,000	20,300	14.9	14
21	October 9 to October 22	14	5	12.6	21.5	4.0	8.3	25.6	2.2	72,000	6,740	9.4	18
22	October 31 to November 5	6	5	12.0	21.5	4.0	7.8	26.7	2.2	105,000	5,000	4.8	30

TABLE 4.—*Mixtures of Ohio River water and sewage—Agar counts, 37° C., after 24 hours' incubation*

Exp. no. and percent sewage	Experiment 15, 5 percent sewage	Experiment 16, 15 percent sewage	Experiment 17, 30 percent sewage	Experiment 18, 45 percent sewage	Experiment 19, 30 percent sewage	Experiment 20, 15 percent sewage	Experiment 21, 5 percent sewage	Experiment 22, 5 percent sewage
Initial count	111,000	150,000	550,000	1,490,000	876,000	136,000	72,000	105,000
Flow time, hours	Percentage of initial bacteria remaining after stated times of flow through the channels							
0	100	100	100	100	100	100	100	100
2	90.0	31.4	77.6	55.7	54.6	57.8	55.3	43.0
4	79.5	22.4	44.7	60.9	30.3	45.0	18.3	16.8
6	76.2	31.7	41.0	52.7	37.5	30.3	25.7	9.0
8	----------	38.1	38.3	64.2	27.4	26.7	20.8	8.3
10	----------	49.5	40.7	52.6	39.8	33.2	14.3	7.6
14	----------	40.2	27.1	31.0	37.5	14.9	10.3	6.9
16	----------	56.0	29.8	29.7	26.7	23.8	11.1	5.9
18	62.5	33.5	38.5	37.1	29.8	26.4	9.4	7.6
20	54.0	39.2	53.2	36.4	19.1	24.1	13.9	6.3
22	55.7	47.1	45.5	36.2	36.8	26.6	10.8	6.4
24	48.9	48.0	47.4	39.8	27.1	34.1	9.8	15.4
26	50.5	44.1	55.4	52.1	29.9	35.9	10.2	8.6
30	34.1	36.1	42.7	46.6	31.8	35.6	12.6	4.8
34	----------	34.4	82.0	75.2	37.8	43.5	9.7	6.1
38	----------	27.4	84.0	51.3	10.4	33.3	9.8	9.6
42	39.4	27.3	93.5	36.1	31.9	37.4	13.5	11.3
46	31.8	33.8	71.0	60.0	30.5	31.8	10.6	7.6

EXPERIMENTS WITH PHYSICAL CHANGES IN CHANNELS

The final series of experiments to be discussed here was designed to provide environmental conditions favorable to a more abundant development of plankton and to observe the effect of such increased plankton growth on the rates of bacterial decrease. For this purpose the uniform cross section of the channel system was changed by inserting at intervals some lengths of wider bottom area and some of steeper gradients. The most important alteration, and the only one which appeared to effect the result, was the replacement of the first 90-foot length of 2-inch channel by a section 12 inches wide and having a fall of 1.5 feet in that distance. The bottom of this section was covered with gravel in order to increase the wetted surface and to make the flow more turbulent. The net effect of this change was to reduce the time of flow through this first 90-foot channel from 1 hour to approximately 20 minutes, and to provide a greatly increased wetted area with more turbulence and aeration, resembling the conditions commonly met in shallow brooks.

In order to provide more adequately for adjustment of the biological life to the conditions under which each experiment was conducted, especially to the change in sewage strength in the influent mixture, *each test was continued without interruption for not less than 4 weeks,* all controllable factors meanwhile being maintained as nearly uniform as possible. A total of six experiments comprise this group, of which the general features of operation and the results obtained are presented in tables 5 and 6, respectively.

TABLE 5.—*Characteristics of series of experiments with mixtures of sewage and Ohio River water flowing through gravel-lined channel bottom*

Experiment no.	Date, 1928	Number of days	Percent sewage concentration	Temperature, ° C.						Bacteria per cc agar, 37° C., 24 hours		Maximum bacterial reduction		Ratio, Agar count / B. coli index	
				Of water			Of air								
				Average	Maximum	Minimum	Average	Maximum	Minimum	Initial	Minimum	Per cent	Hour reached	Initial	Final, 45 hours
23	May 28 to June 16	20	5	18.2	25.0	11.5	18.9	30.0	10.0	62,230	496	99.2	44	---	---
24	June 25 to July 21	27	15	22.2	2[illegible].0	14.0	23.3	33.9	12.2	124,000	354	9[illegible].7	22	6.5	34.8
25	July 23 to August 18	27	30	25.0	31.5	18.0	24.4	33.9	11.7	62[illegible],[illegible]00	2,47[illegible]	9[illegible].6	4[illegible]	1[illegible].1	[illegible]23
26	August 2[illegible] to September 22	34	45	22.6	31.5	13.5	23.0	35.0	10.0	707,[illegible]0	3,9[illegible]0	[illegible]9.4	4[illegible]	[illegible].5	71.8
27	September 24 to October 27	34	30	18.6	28.0	10.5	20.0	33.0	7.0	442,0[illegible]0	4,[illegible]00	[illegible].9	4[illegible]	[illegible].5	29.9
28	October 29 to November 24	27	15	10.9	21.0	4.5	12.5	25.0	3.0	102,000	991	99.0	42	4.3	25.3

TABLE 6.—*Ohio River water and sewage in gravel-lined channel*

	Agar counts, 24 hours at 37° C.						Coli-aerogenes group index				
Exp. no. and percent sewage	Experiment 23, 5 percent sewage	Experiment 24, 15 percent sewage	Experiment 25, 30 percent sewage	Experiment 26, 45 percent sewage	Experiment 27, 30 percent sewage	Experiment 28, 15 percent sewage	Experiment 24, 15 percent sewage	Experiment 25, 30 percent sewage	Experiment 26, 45 percent sewage	Experiment 27, 30 percent sewage	Experiment 28, 15 percent sewage
Initial count	62,600	123,000	626,000	707,000	442,000	102,000	18,900	41,500	156,000	126,000	23,800
Flow-time, hours	Percentage of bacteria remaining after stated times of flow										
0	100	100	100	100	100	100	100	100	100	100	100
½	----	10.4	9.74	22.5	23.3	32.4	35.4	7.25	32.1	29.7	19.6
2	32.8	9.67	6.31	11.8	10.4	12.8	1.60	6.75	29.5	3.85	2.94
4	28.1	7.78	5.28	11.3	10.4	9.65	1.72	1.31	29.5	2.73	15.5
6	19.8	5.09	5.15	9.70	4.73	8.34	1.34	1.31	28.3	3.65	4.20
8	15.9	3.92	5.10	10.4	4.84	8.75	1.47	.73	17.9	2.63	2.94
10	5.64	3.56	7.48	10.9	5.23	6.91	.28	.73	5.26	1.82	16.8
14	6.06	1.64	2.36	4.79	2.31	6.47	.15	.67	1.56	.32	2.94
16	6.83	.56	1.59	3.41	5.90	6.44	.14	.61	2.59	.30	2.94
18	4.28	.67	1.97	3.90	4.19	5.15	.14	.02	2.59	.055	2.94
20	3.94	.38	.76	3.48	3.80	3.87	.15	.07	.41	.37	.42
22	5.05	.29	.78	9.17	4.93	5.22	.04	.007	3.99	.067	2.94
24	3.70	.73	1.56	4.85	3.42	3.38	.21	.04	1.51	.40	7.98
26	----	.94	1.18	3.80	2.74	4.06	.13	.13	1.68	.18	.42
30	----	.42	.55	2.07	1.20	2.09	1.32	.02	1.44	.26	.29
34	2.30	.54	.66	2.08	1.10	1.80	.03	.01	.28	.30	.17
38	2.00	.39	.79	.95	2.62	1.10	.14	.002	.053	.055	.29
42	.98	.40	.68	.78	2.26	.97	.04	.007	.018	.17	.23
45	.50	.61	.39	.56	1.11	.99	.12	.007	.035	.13	.17
48	1.10	----	----	----	----	----	----	----	----	----	----

An inspection of these rates of bacterial decrease indicates *very much* higher rates of purification than were obtained in the previous experiments, and especially during the first 2 hours. In fact, the greatest reduction occurred during the 20 minutes of flow through the first channel, which, as above noted, was changed to a steep-sloping trough 12 inches wide and having a gravel-lined bottom. Luxuriant growths of numerous species of plankton developed in this channel, becoming attached both to the gravel and the channel sides, forming a spongy mass over and through which the water trickled. This biological carpet presumably effected the higher rate of bacterial decrease of the flowing stream amounting, in some of the experiments, to as much as 90 percent in the first 20 minutes. This is a much more rapid rate of purification than has been observed in any of the natural streams which have been studied; it more nearly approximates the rates observed in sewage sprinkling filters.

Following this preliminary rapid reduction in bacteria, the decline continues at a slower but nonuniform rate, fluctuating and even for short periods showing moderate increases in bacterial numbers. Again there may be noted a certain rhythm in these changes moving up and down about an average level, or a generally declining trend. Such variations are, of course, more clearly defined in the daily observations in which these wave effects are not smoothed out by the system of averaging. Again, as in previous experiments, no consistent relation is shown between the rate of purification observed and the initial bacterial content, within the limits studied, although there is a very definite tendency for the rate to decline in passing down the channel.

In general, the rates of bacterial decrease observed in this group of experiments are much more rapid in the first third hour (corresponding to the time of passage through the first wide channel) than any that have been observed in large natural streams. The most nearly comparable data available are those of the upper Illinois River where the current is swift and turbulent and where attached plankton growths are prolific. Using averages of observations made at approximately the same times of flow from points of maximum bacterial concentrations, comparative percentages of remaining bacteria obtained. These data, presented in Table 7, the 37° C. agar counts of which are plotted in figure 7, clearly illustrate this higher rate of bacterial purification in the experimental channels.

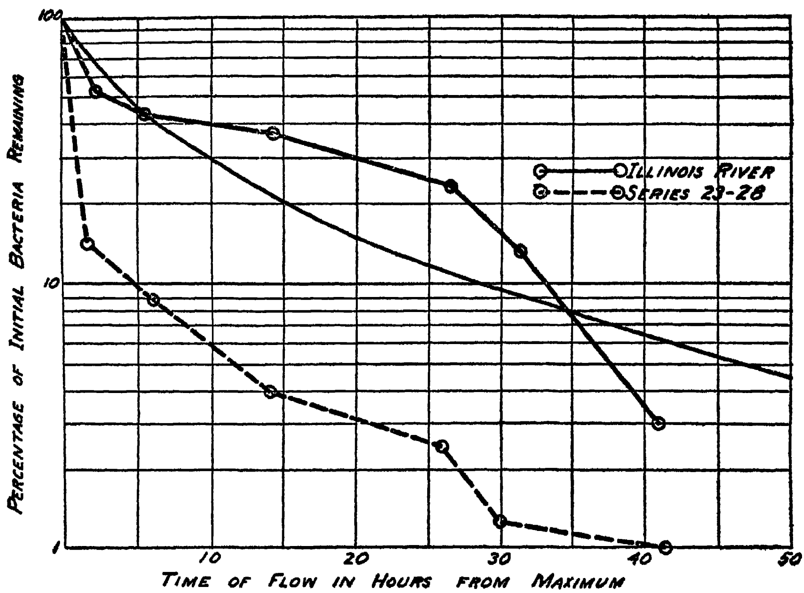

Figure 7.—Comparison of rates of bacterial change in mixtures of sewage and Ohio River water flowing in the experimental channels with those observed in the Illinois River. Agar counts at 37° C., 24 hours.

Table 7.—*Comparison of rates of bacterial change (upper Illinois River and experimental channels)*

Time of flow (hours)	Percentage of bacteria remaining			
	37° C. agar count		Coli-aerogenes group	
	Illinois River	Channels, average of series 23 to 28	Illinois River	Channels, average of series 24 to 28
0.0	100	100	100	100
2.0	51	14	47	8.9
5.5	42		27	
6.0		8.8		7.8
14.3	38		38	
14.0		4.0		1.1
27 0	24		20	
26.0		2.5		.5
31.8	14		16	
30.0		1.3		.7
41.1	3.0		5.6	
42.0		1.0		1.09

SUMMARY

The general conclusion to be drawn from those observations on the bacterial counts in polluted waters under natural and experimental conditions is that the reduction in bacteria which is consistently observed is due chiefly to the activity of bacteria-eating plankton, which are wholly or in part dependent upon the bacteria for their food

supply. Except for the presence of predatory plankton, the environment existing even in moderately polluted waters is sufficiently favorable to permit considerable multiplication of such bacteria as are included in standard plate counts, at rates varying with temperature. It is believed, therefore, that the decrease in bacteria which is usually observed in polluted streams is to be interpreted as the difference between their rate of multiplication and the rate of destruction by foraging plankton. Any disturbance of the existing balance between the plankton and the bacterial population alters the rate of change in the latter; and since this balance is in constant process of readjustment, the rate of bacterial decrease is constantly changing, and not infrequently the direction of change is temporarily reversed.

The most favorable conditions for rapid bacterial reduction are met where a highly polluted water, rich in plankton food supply, passes over an attached, stationary plankton "carpet". Physical factors tending to increase the rate of bacterial destruction by bringing about this biological condition are (*a*) increase of the wetted area in proportion to volume, and (*b*) turbulence in the stream, promoting contact with the biological carpet and aeration.[3]

Natural streams exhibit all grades of variation with respect to these conditions, ranging from deep, sluggish channels with a minimum of wetted surface area in proportion to volume, up to broad, shallow riffles such as occur in trickling brooks. It would seem reasonable to expect, therefore, a correspondingly wide variation in their natural purification rates; and, in fact, the evidence thus far accumulated indicates a continuous gradation from the low rates of purification observed in deep broad rivers to the extremely rapid rates occurring in sewage trickling filters. It is probable that the dominant physical factor in these different rates is the relationship between volume of flow and wetted area of the channel cross section.

The view that attached plankton, on the bottom and margins of the stream channel, play a large part in bacterial destruction explains the increase in bacteria which is observed when polluted river water is removed from the stream and stored in laboratory containers. Storage, in effect, temporarily eliminates all plankton-covered wetted surfaces and at the same time produces, perhaps, other minor changes in environmental conditions to which the plankton require a certain time to become adjusted.

ACKNOWLEDGEMENTS

Acknowledgement is due to the personnel of the Stream Pollution Investigations Station for performing the extensive analytical work on which the data herein presented are based, and especially to

[3] Such physical and biological conditions (*10*) are found in the Illinois River immediately below the outlet of the Chicago Drainage Canal, and in this zone bacterial purification proceeds at a very rapid rate.

technical assistant in sanitary engineering C. T. Carnahan, who was in direct charge of operation of the channel system. To our consultant, Dr. W. H. Frost, grateful appreciation is expressed for his continued interest and helpful suggestions contributed throughout the period of this study.

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THE WEIL-FELIX REACTION IN EXPERIMENTAL ROCKY MOUNTAIN SPOTTED FEVER AND CERTAIN OTHER TYPHUS-LIKE DISEASES [1]

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In the experimental study of typhus-like diseases the guinea pig is the laboratory animal most extensively used. This is because of its value for the maintenance of strains of *passage* virus and the characteristic febrile reaction and lesions of spleen, brain, and scrotum which some of the viruses induce. The rabbit, however, though of less value in some respects, has a special field of usefulness, since it produces

[1] Contribution from the Rocky Mountain Laboratory of the United States Public Health Service at Hamilton, Mont.
Presented before the American Society of Tropical Medicine, San Antonio, Tex., Nov. 16, 1934.

agglutinins for the several *Proteus* X types. These have not been demonstrated in the guinea pig by the customary procedures.

As early as 1921 Weil and Felix showed that when rabbits were injected with brain suspensions of typhus-infected guinea pigs the formation of agglutinins for *Proteus* OX 19 was "remarkably constant and uniform." Maxcy (1929) and Dyer et al. (1931 a and b) obtained similar results with endemic typhus of the United States. Munter (1928) found that when rabbits were injected with Rocky Mountain spotted fever virus the Weil-Felix reaction was positive with the X 19 strain, while Kuczynski (1927) found this to be true only occasionally. In one instance the latter noted a low titer for an X 2 strain, a result of interest in view of our recent findings, to be mentioned later.

In human sera from the typhus-like diseases the *Proteus* X type agglutinins which are almost constantly present, which appear early in the disease, and which attain a high titer, are termed "main" agglutinins, while the type which appear later and in low titer or are at times altogether absent are classed as "group" agglutinins. Felix has pointed out that only the main agglutinins can be demonstrated in rabbits. He has further shown that a subsequent injection of the same *passage* virus does not restimulate the production of agglutinins, inasmuch as the quantity of virus injected is very small and does not multiply under the given conditions. However, if following the initial infection the rabbit is infected with a different typhus virus, agglutinins are again produced, the type agglutinin depending on the virus. Felix has consequently (1933) recommended the rabbit "for the analysis of the antigenic structure of the different typhus viruses by means of serological tests with the various types of *Proteus* X."

In line with Felix's suggestion and in continuation of certain former studies, several groups of rabbits were injected intraperitoneally or intravenously with guinea pig *passage* virus of one of the typhus-like diseases and later with that of another. Various combinations of the following viruses have been used: (1) Rocky Mountain spotted fever; (2) Sao Paulo exanthematic typhus; (3) endemic typhus of United States; and (4) boutonneuse fever.

All rabbits were bled previous to the injection of virus to determine the agglutinin content of the "normal" serum. They were bled again, routinely, on the fourteenth and sixteenth days following injection, as frequent trial bleedings have shown that, with the viruses used, the maximum agglutinin titers are obtained at this time. Subsequent bleedings were made at the same intervals following the second injection of virus. *Proteus* X strains OXK, OX2, HX2, and OX19 were used for the agglutination test. The serum-bacterial suspension mixtures were incubated at 37° C. for 2 hours and the

readings made following an additional 36 to 48 hours at approximately 8° C.[2]

EXPERIMENTAL DATA

Of six rabbits injected with the virus of exanthematic typhus of Sao Paulo and subsequently with the virus of spotted fever, 100 percent gave a positive Weil-Felix reaction with OX2, OX19, or both, following the first injection, while all were negative following the second. When the order of injection of the two viruses was reversed, the positive reaction again followed the first injection, while following the second there was no restimulation of agglutinins.

Of 10 rabbits injected with the virus of spotted fever and subsequently with virus of boutonneuse fever, 100 percent gave a positive Weil-Felix reaction with OX2, OX19, or both, following the first injection and none following the second.

Of 24 rabbits injected with boutonneuse-fever virus and subsequently with the virus of spotted fever, 100 percent were essentially negative following the first injection, while only 4 were positive following the second.

Of 6 rabbits injected with the virus of endemic typhus 5 gave a positive Weil-Felix reaction with *Proteus* OX19, but the results were negative following the subsequent injection of spotted-fever virus which produced typical thermic curves, scrotal lesions, and a positive Weil-Felix reaction in 2 control rabbits. When the viruses were injected in the reverse order, all animals gave a positive reaction with OX2 following the injection of spotted-fever virus, while only OX19 agglutinin appeared after the injection of typhus virus.

Selected examples of the above reactions are shown in tables 1 to 5. The results of agglutination tests with human sera used as controls on the agglutinibility of the several *Proteus* X strains are shown in table 6.[3]

DISCUSSION

The above data show that, following the injection of either spotted fever or Sao Paulo typhus virus into rabbits, X2 agglutinins are present even more regularly than the X19 type. This is the first record of the presence of these agglutinins in significant titer in rabbit sera following infection with any of the typhus viruses. Both types of agglutinins are also present in human sera, although in the latter X19 agglutinins are usually of higher titer. These reactions afford

[2] To make certain that our *Proteus* X strains were of standard agglutinibility, several sera were sent to Dr. A. Felix, of the Lister Institute, London, without comment other than that they were from spotted-fever infected rabbits. The results kindly forwarded by Dr. Felix were comparable in all respects with those recorded in this paper.

[3] I take this opportunity to thank Dr. R. Lewthwaite, of the Institute of Medical Research, Kuala Lumpur, Federated Malay States, and Dr. James G. McAlpine, director of laboratories, State Board of Health, Montgomery, Ala., for sera from typhus cases, and Dr. A. Felix, of the Lister Institute, London, for *Proteus* X strains and his further kindness in testing the several sera sent him.

further evidence of the close relationship or identity of spotted fever and Sao Paulo typhus as indicated by former experimental studies which showed reciprocal cross-immunity, reciprocal cross-protection

TABLE 1.—ROCKY MOUNTAIN SPOTTED FEVER AND EXANTHEMATIC TYPHUS OF SAO PAULO IN RABBITS

Each rabbit received 1cc spotted fever guinea-pig passage virus (blood)				Each rabbit received 1cc Sao Paulo typhus guinea-pig passage virus (blood)	
Rabbit No.	Proteus X strain	Temperature record following injection	W-F reaction 14 to 16 days following injection	Temperature record following injection	W-F reaction 14 to 16 days following injection
5246	OX19	Temperatures	320		40
	OX2		320	Released	20
	HX2	ranging	320		20
	OXK		20		0
5247	OX19	from 40°c.	160		80
	OX2		160	Released	80
	HX2	to 41°c for	160		40
	OXK		20		20
5248	OX19	several days.	40		40
	OX2		160	Released	40
	HX2	Complete	160		20
	OXK		20		20
5252	OX19	records not	160		20
	OX2		640	Released	160
	HX2	kept	640		40
	OXK		20		20

TABLE 2.—EXANTHEMATIC TYPHUS OF SAO PAULO AND ROCKY MOUNTAIN SPOTTED FEVER IN RABBITS

Each rabbit received 1cc Sao Paulo typhus guinea-pig passage virus (blood)					Each rabbit received 1cc spotted fever guinea-pig passage virus (blood)	
Rabbit No.	Proteus X strain	W-F reaction before injection	Temperature record following injections	W-F reaction 14 to 16 days after injection	Temperature record following injections	W-F reaction 14 to 16 days after injection
5220	OX19	0	Scrotum typical	80		0
	OX2	0		320	Released	0
	HX2	0		320		0
	OXK	0		40		20
5221	OX19	0	Scrotum typical	80		0
	OX2	0		640	Released	160
	HX2	20		640		160
	OXK	0		20		0
5223	OX19	40	Scrotum typical	80		40
	OX2	80	Scrotal sloughing	640	Death	80
	HX2	80		1280		80
	OXK	20		80	Intercurrent infection	0
5224	OX19	0	Scrotum typical	80		0
	OX2	20	Scrotal sloughing	320	Released	40
	HX2	0		320		40
	OXK	0		80		0
5238	OX19			Controls	Scrotum typical	0
	OX2					320
	HX2			Rabbits		160
	OXK			received	Released	80
5239	OX19			only spotted	Scrotum typical	80
	OX2			fever virus		320
	HX2					160
	OXK				Released	40

or virus neutralization, and that equal protection is conferred by either spotted fever vaccine or Sao Paulo typhus vaccine against both diseases. (Parker and Davis, 1933; Davis and Parker, 1933; Dyer, 1933; Monteiro, 1933.)

While the Weil-Felix reaction with rabbit sera emphasizes the similarity of the antigenic structure of the viruses of spotted fever and Sao Paulo typhus, it also indicates a difference between these two viruses and that of boutonneuse fever in which the Weil-Felix reaction

TABLE 3—ROCKY MOUNTAIN SPOTTED FEVER AND ENDEMIC TYPHUS (U S A) IN RABBITS

		Each rabbit received 1st spotted fever guinea-pig passage virus (blood)		Each rabbit received 3rd endemic typhus passage virus (testicular washings)	
Rabbit No	Proteus X strain	Temperature record following injection	W F reaction 14 to 16 days after injection	Temperature record following injection	W-F reaction 14 to 16 days after injection
5253	OX19	Temperatures	320	Released ↓	1280
	OX2	ranging from	640		80
	HX2		320		40
	OXK		40		40
5258	OX19	40°C to 41°C	40	Released ↓	640
	OX2	for several	320		80
	HX2		160		80
	OXK		40		20
5259	OX19	days complete	80	Released ↓	1280
	OX2	records not	320		40
	HX2		320		20
	OXK		40		0
5254	OX19	kept	80	Released ↓	80
	OX2		160		40
	HX2		160		40
	OXK		20		40
5265	OX19		Control	Released ↓	320
	OX2		Rabbit received		0
	HX2		only endemic		0
	OXK		typhus virus		0

TABLE 4—ENDEMIC TYPHUS (U.S A) AND ROCKY MOUNTAIN SPOTTED FEVER IN RABBITS

		Each rabbit received 3rd endemic typhus virus (testicular washings)			Each rabbit received 1st spotted fever guinea-pig passage virus (blood)	
Rabbit No	Proteus X strain	W-F reaction before injection	Temperature record following injection	W-F reaction 14 to 16 days after injection	Temperature record following injection	W-F reaction 14 to 16 days after injection
5232	OX19	20		320	Released ↓	40
	OX2	40		40		40
	HX2	20		40		40
	OXK	20		40?		40
5234	OX19	0	Scrotum typical ↓	320	Released ↓	80
	OX2	40		40		80
	HX2	40		40		40
	OXK	40		40		40
5235	OX19	0		160	Released ↓	80
	OX2	0		0		40
	HX2	20		0		40
	OXK	20		20		0
5237	OX19	0	Scrotum typical ↓	320	Released ↓	80
	OX2	40		40		40
	HX2	20		40		40
	OXK	20		20		40
5238	OX19			Controls	Scrotum typical ↓	0
	OX2			Rabbits re-		320
	HX2			ceived only		160
	OXK				Released ↑	80
5239	OX19			Spotted	Scrotum typical ↓	40
	OX2			fever virus		320
	HX2					160
	OXK				Released ↑	40

is generally negative This is in spite of definite infection in most rabbits, as shown by the fact that 20 of 24 boutonneuse fever injected rabbits were subsequently immune to spotted fever. This lack of agglutinin production in rabbits confirms the earlier observation of

Davis and Parker (1934), who have shown that spotted fever vaccine which affords equal protection against the highly virulent viruses of spotted fever and Sao Paulo typhus confers little or no protection against the relatively benign boutonneuse fever, although there is complete cross-immunity between spotted fever and boutonneuse fever in guinea pigs.

TABLE 5.—BOUTONNEUSE FEVER AND ROCKY MOUNTAIN SPOTTED FEVER IN RABBITS

Each rabbit received 3rd boutonneuse fever guinea-pig passage virus (testicular washings)					Each rabbit received 1st spotted fever guinea-pig passage virus (blood)	
Rabbit No.	Proteus X strains	W-F reaction before injection	Temperature record following injection	W-F reaction 14 to 16 days after injection	Temperature record following injection	W-F reaction 14 to 16 days after injection
5269	OX19	0		0	Released	20
	OX2	0		0		20
	HX2	0		0		20
	OXK	0		40		80
5271	OX19	20		20	Released	20
	OX2	0		0		0
	HX2	0		0		0
	OXK	0		0		0
5273	OX19	0	Scrotum typical	20	Released	80
	OX2	0		80		320
	HX2	0		80		320
	OXK	0		20		40
5274	OX19	0	Scrotum suggestive	0	Released	0
	OX2	0		0		0
	HX2	0		0		20
	OXK	0		0		20
5262	OX19	0		Control rabbit received only spotted fever virus	Released	640
	OX2	0				80
	HX2	0				80
	OXK	20				160

TABLE 6.—HUMAN SERA AS CONTROLS ON THE AGGLUTINIBILITY OF PROTEUS X STRAINS

Control sera: Disease	Control sera: Serological type	Source	Agg'n (type) titer at source	Agg'n titer Hamilton, Mont.: OX19	OX2	OXK
Endemic typhus U.S.A.	X19	Dr. McAlpine, Montgomery, Ala.	1- 640	1280	0	0
			2- 640	640	0	0
			3- 640	640	0	0
Tropical typhus Malaya	X19	Dr. Lewthwaite, Kuala Lumpur, Malaya	1025	2560	0	0
Tropical typhus Malaya	XK	Dr. Lewthwaite, Kuala Lumpur, Malaya		0	0	2560
Spotted fever	OX2 (?)	Western United States		640	2560	0
Spotted fever	OX2 (?)	Western United States		320	1280	0

In contradistinction to the definite febrile reactions induced in rabbits by the virus of spotted fever or Sao Paulo typhus, the injection of *passage* virus of either boutonneuse fever or endemic typhus seldom induces a rise in temperature. However, X19 agglutinins,

which are absent following the injection of boutonneuse fever virus, may be produced in high titer following the injection of the virus of endemic typhus

Although it is generally accepted that there is no cross-immunity between spotted fever and endemic typhus in guinea pigs, certain evidence on hand indicates that some degree of added resistance to infection by either virus is conferred by a previous infection with the other. When rabbits are injected first with the virus of endemic typhus and subsequently with spotted fever virus there is little or no serological or other reaction following the latter injection, although control animals show a rise in temperature, scrotal lesions, and a positive Weil-Felix reaction with OX2, OX19, or both. On the other hand rabbits which have shown typical thermal and Weil-Felix reactions following the injection of spotted fever virus may also show a marked rise in agglutinins for OX19 following a subsequent injection of endemic typhus virus. Although this suggests a partial one-way immunity, the failure to obtain reciprocal cross-immunity as indicated by the restimulation of agglutinins in the case just cited may be considered as an expression of the nonidentity of the viruses. Since OX2, as well as OX19, agglutinins are present in both human or rabbit spotted fever sera, and OX2 agglutinins are absent from both endemic typhus human and rabbit sera, it is suggested that the Weil-Felix reaction may be of value in the differential diagnosis, especially in regions where both diseases are present.

The criteria for the differentiation of the main and group agglutinins, as presented by Felix when applied to either spotted fever or Sao Paulo typhus, do not place OX2 agglutinins in the group class. However, my results with human and rabbit sera indicate that both OX19 and OX2 agglutinins may be of the group type, as suggested by Felix and Rhodes (1931) for boutonneuse fever, or that both are of equal main type value.

That differences in agglutinin response to these viruses are, in some instances, due to the ability on the part of certain individuals to react to the infection with the production of only certain types of agglutinins is suggested by human and rabbit spotted fever sera in which only OX2 or only OX19 agglutinins are demonstrable, while in other cases both are present. However, it has been shown by Davis and Parker (1932) that certain spotted fever sera which contain agglutinins in high titer for OX2 and in relatively low titer for OX19, have little or no protective value against the stock strains of *passage* virus. It thus appears that there may be distinct serological varieties of clinical spotted fever and that the type of Weil-Felix reaction may correspond to the protective properties of the respective sera. Further studies bearing on this hypothesis are being made.

The significant suggestion that the type of agglutinins produced is an expression of the antigenic structure of the virus is well supported by such evidence as the agglutination of *Proteus* XK in rural typhus of Malaya and in tsutsugamushi, while in the urban typhus of Malaya and in endemic typhus of the United States agglutinins only of the X19 type are found. These constant serological relationships which exist between the several known types of *Proteus* X and the several varieties of typhus (relationships which confirm, or are confirmed by, generally accepted immunological procedures) have suggested to numerous workers a specific relationship between *Proteus* X organisms and the typhuslike viruses. Regarding this question, it is to be hoped that the continuation of culture studies, such as those of Kuczynski, Fegin, and Anigstein and Amzel and further research on specific soluble substances such as have been made by White, Castaneda and Zia, Castaneda, Kemp, and others, including ourselves, may result in information of conclusive value. Meantime it may be well to keep in mind available information and further possibilities on microbic dissociation without definite commitment to any theory.

In relation to dissociation, Welch and Poole and Welch, Mickle, and Borman have recently made two very pertinent studies on the pleoantigenicity of *Proteus* X19. These authors have shown that this strain may contain normally nonfunctioning agglutinogens which may be freed by spontaneous dissociation and consequently give false positive reactions in the Weil-Felix test with sera from other than the group of typhuslike diseases and false negative reactions with sera from these diseases. It thus appears that the term *Proteus* applies to the antigenic structure as well as to the morphological or colonial structure, and with much greater significance.

SUMMARY

It is shown that agglutinins of *Proteus* OX2, as well as for OX19, appear in significant titer in the serum of rabbits following injection with the *passage* viruses of Rocky Mountain spotted fever or Sao Paulo typhus. Although these agglutinins are perhaps of the group type, they cannot be so considered according to Felix's criteria. Following similar injections with *passage* virus of boutonneuse fever, Weil-Felix tests with the available *Proteus* X strains are essentially negative.

The Weil-Felix reaction with rabbit sera confirms former findings as to the relationships of spotted fever, Sao Paulo typhus, and boutonneuse fever.

The presence of agglutinins of X2 type in human and rabbit spotted fever sera and their absence in human and rabbit endemic typhus (U. S. A.) sera suggest that the Weil-Felix reaction may aid

in the differential diagnosis, especially in regions where both diseases are endemic.

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DEATHS DURING WEEK ENDED MAR. 2, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Mar. 2, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	9,477	9,180
Deaths per 1,000 population, annual basis	13.2	12.8
Deaths under 1 year of age	694	657
Deaths under 1 year of age per 1,000 estimated live births	64	61
Deaths per 1,000 population, annual basis, first 9 weeks of year	13.0	12.7
Data from industrial insurance companies:		
Polices in force	67,432,737	67,506,955
Number of death claims	15,011	15,836
Death claims per 1,000 policies in force, annual rate	11.6	12.2
Death claims per 1,000 policies, first 9 weeks of year, annual rate	10.8	10.9

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Mar. 9, 1935, and Mar. 10, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 9, 1935, and Mar. 10, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 9, 1935	Week ended Mar. 10, 1934	Week ended Mar. 9, 1935	Week ended Mar. 10, 1934	Week ended Mar. 9, 1935	Week ended Mar. 10, 1934	Week ended Mar. 9, 1935	Week ended Mar. 10, 1934
New England States:								
Maine	2		214		538	1	0	0
New Hampshire				2	16	126	0	0
Vermont					4	54	0	0
Massachusetts	5	19			471	2,356	2	2
Rhode Island		4			112	9	0	0
Connecticut	7	2	2	2	997	36	3	1
Middle Atlantic States:								
New York	21	53	[1] 20	[1] 22	2,226	1,330	15	4
New Jersey	17	15	14	24	1,058	547	3	0
Pennsylvania	60	54			5,103	3,063	4	7
East North Central States:								
Ohio	41	17	28	21	810	888	9	0
Indiana	18	22	70	64	468	750	3	1
Illinois	45	23	71	39	2,700	1,473	19	3
Michigan	18	18	13	3	2,340	95	1	3
Wisconsin	1	5	98	66	2,290	1,278	0	2
West North Central States:								
Minnesota	5	4		2	1,813	315	8	0
Iowa	5	1		11	1,163	158	6	1
Missouri	28	85	243	188	873	1,354	7	2
North Dakota	9	1	27	29	33	129	0	0
South Dakota	1	3	5		38	837	0	0
Nebraska	6	1			336	50	1	1
Kansas	4	11	21		1,255	256	1	0
South Atlantic States:								
Delaware	2		2		2	269	0	0
Maryland [2]	9	7	72	21	141	670	2	0
District of Columbia	13	10	3	1	32	555	11	0
Virginia	11	26			1,216	1,334	4	2
West Virginia	21	14	234	83	518	48	3	0
North Carolina [3]	9	25	67	49	607	2,822	4	1
South Carolina	5	7	425	871	62	654	15	0
Georgia [3]	15	16	387			1,817	0	2
Florida	9	6	39	2	36	279	0	0
East South Central States:								
Kentucky	15	27	103	113	1,141	635	4	0
Tennessee [3]	13	8	228	132	89	1,180	9	8
Alabama [3]	8	23	761	102	433	875	4	2
Mississippi [3]	9	3					2	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 9, 1935, and Mar. 10, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 9, 1935	Week ended Mar. 10, 1934	Week ended Mar. 9, 1935	Week ended Mar. 10, 1934	Week ended Mar. 9, 1935	Week ended Mar. 10, 1934	Week ended Mar. 9, 1935	Week ended Mar. 10, 1934
West South Central States:								
Arkansas	8	7	118	105	41	492	2	0
Louisiana	22	35	27	16	175	185	3	0
Oklahoma [4]	20	15	505	124	188	490	9	0
Texas [3]	72	106	2,589	724	163	1,131	9	3
Mountain States:								
Montana	6	8		26	111	57	0	1
Idaho		1	4		46	19	0	1
Wyoming	4				211	77	1	0
Colorado	9	6			708	235	1	0
New Mexico	7	9	9	2		58	2	0
Arizona	1	1	105	17	26	38	0	0
Utah [3]	1	1			23	624	2	0
Pacific States:								
Washington	3	2	5	2	207	173	2	0
Oregon		3	144	81	95	107	1	0
California	42	39	377	27	598	1,491	7	2
Total	627	693	7,030	2,971	31,522	31,420	174	49

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 9, 1935	Week ended Mar. 10, 1934	Week ended Mar. 9, 1935	Week ended Mar. 10, 1934	Week ended Mar. 9, 1935	Week ended Mar. 10, 1934	Week ended Mar. 9, 1935	Week ended Mar. 10, 1934
New England States:								
Maine	0	0	22	10	0	0	0	1
New Hampshire	0	0	2	7	0	0	0	0
Vermont	0	0	17	6	0	0	0	0
Massachusetts	0	1	208	275	0	0	1	1
Rhode Island	0	0	15	23	0	0	0	0
Connecticut	0	0	70	71	0	0	0	1
Middle Atlantic States:								
New York	3	1	952	874	0	0	4	10
New Jersey	0	0	166	216	0	0	0	2
Pennsylvania	0	1	675	798	0	0	2	9
East North Central States:								
Ohio	1	0	1,083	826	0	1	3	2
Indiana	0	0	237	261	1	1	0	2
Illinois	2	0	1,046	654	1	3	6	6
Michigan	0	0	423	801	0	6	2	3
Wisconsin	0	1	508	308	22	10	1	2
West North Central States:								
Minnesota	1	0	150	66	7	5	0	0
Iowa	1	0	67	85	1	18	1	1
Missouri	0	0	66	118	2	0	5	2
North Dakota	0	0	211	13	3	0	0	0
South Dakota	0	0	11	12	1	10	0	0
Nebraska	0	1	87	11	17	0	1	0
Kansas	0	0	94	97	32	1	0	1
South Atlantic States:								
Delaware	0	0	29	11	0	0	0	0
Maryland [3]	0	0	109	95	0	0	2	2
District of Columbia	0	0	65	17	0	0	0	0
Virginia	0	2	38	33	0	0	2	3
West Virginia	0	0	158	77	1	0	2	2
North Carolina [3]	0	0	41	37	0	0	1	0
South Carolina	0	0	5	6	0	0	8	6
Georgia [3]	0	0	11	4	0	0	1	9
Florida	0	0	8	2	12	0	0	1
East South Central States:								
Kentucky	0	0	54	60	1	0	4	6
Tennessee [3]	0	0	30	26	0	9	8	3
Alabama [3]	0	0	12	10	0	0	1	0
Mississippi [3]	0	0	13	5	1	0	2	3

See footnotes at end of table.

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 9, 1935	Week ended Mar. 10, 1934	Week ended Mar. 9, 1935	Week ended Mar 10, 1934	Week ended Mar. 9, 1935	Week ended Mar. 10, 1934	Week ended Mar. 9, 1935	Week ended Mar. 10, 1934
West South Central States:								
Arkansas	0	0	5	5	2	2	1	4
Louisiana	0	0	14	22	2	1	5	17
Oklahoma [4]	0	0	16	17	2	0	1	7
Texas [3]	1	0	121	120	30	39	14	10
Mountain States:								
Montana	0	0	19	17	0	0	1	0
Idaho	0	0	2	2	0	16	1	0
Wyoming	0	0	49	3	14	0	0	0
Colorado	1	0	354	24	1	2	0	0
New Mexico	0	1	16	24	0	1	8	0
Arizona	0	0	24	13	0	0	0	0
Utah [2]	0	0	102	7	0	4	0	0
Pacific States:								
Washington	1	3	72	83	29	10	3	5
Oregon	0	0	54	38	0	0	0	2
California	13	2	206	247	3	4	4	11
Total	24	13	7,747	6,537	185	143	85	134

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Mar. 9, 1935, 12 cases, as follows: North Carolina, 2; Georgia, 2; Tennessee, 1; Alabama, 1; Texas, 6.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January 1935										
California	20	283	1,504	3	1,239	7	67	1,339	49	43
Nevada		3	39		3		0	9	0	0
February 1935										
Arkansas	15	32	656	38	163	7	0	75	5	10
Maine		5	20		1,117		1	84	0	7
Massachusetts	2	42		1	2,008		2	724	0	1
Missouri	41	168	2,408	22	2,619		2	486	8	13
Vermont		1			20		0	77	0	1

January 1935

California:	Cases
Chicken pox	2,957
Dysentery, amoebic	8
Dysentery, bacillary	17
Epidemic encephalitis	4
Food poisoning	18
German measles	290
Granuloma, coccidioidal	1
Jaundice, epidemic	7
Mumps	910
Ophthalmia neonatorum	2
Paratyphoid fever	2
Rabies in animals	97
Septic sore throat	10
Tetanus	9
Trachoma	16
Trichinosis	5
Undulant fever	18
Whooping cough	502

January 1935

Nevada:	Cases
Chicken pox	40
Mumps	1
Septic sore throat	1
Whooping cough	2

February 1935

	Cases
Chicken pox:	
Arkansas	113
Maine	202
Massachusetts	1,202
Missouri	
Vermont	
Dysentery:	
Missouri	7
Epidemic encephalitis:	
Massachusetts	1
German measles:	
Maine	147
Massachusetts	1,907
Lead poisoning:	
Massachusetts	1
Mumps:	
Maine	54
Massachusetts	290
Missouri	287
Vermont	
Ophthalmia neonatorum:	
Massachusetts	48
Missouri	1
Rabies in animals:	
Massachusetts	27
Missouri	4
Septic sore throat:	
Massachusetts	18
Missouri	79
Tetanus:	
Massachusetts	1
Trachoma:	
Arkansas	1
Massachusetts	3
Missouri	5

February 1935

	Cases
Trichinosis:	
Massachusetts	22
Tularaemia:	
Arkansas	2
Missouri	4
Typhus fever:	
Massachusetts	1

February 1935

	Cases
Undulant fever:	
Maine	1
Massachusetts	3
Missouri	5
Vincent's infection:	
Maine	3

February 1935

	Cases
Whooping cough:	
Arkansas	42
Maine	173
Massachusetts	817
Missouri	280
Vermont	105

WEEKLY REPORTS FROM CITIES

City reports for week ended Mar. 2, 1935

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0		0	0	4	4	0	0	1	1	33
New Hampshire:											
Concord	0		0	0	2	0	0	1	0	0	14
Nashua	0			0		0	0		0	0	
Vermont:											
Barre	0		0	0	0	0	0	0	0	3	4
Burlington	0		0	15	0	3	0	0	1	0	9
Massachusetts:											
Boston	8		0	13	40	40	0	14	0	29	224
Fall River	0		0	155	2	0	0	6	0	6	27
Springfield	0		0	138	2	8	0	1	0	11	38
Worcester	0		0	10	2	10	0	2	0	11	51
Rhode Island:											
Pawtucket	0		0	1	0	1	0	0	0	0	22
Providence	3		1	21	7	9	0	3	0	7	98
Connecticut:											
Bridgeport	0		0	2	1	20	0	0	0	1	24
Hartford	1		0	109	3	10	0	3	0	16	55
New Haven	0	2	2	119	4	0	0	1	0	0	46
New York:											
Buffalo	0		2	227	25	62	0	12	0	25	169
New York	27	20	2	683	173	515	0	86	6	236	1,622
Rochester	0		0	272	4	10	0	0	1	13	51
Syracuse	0		1	78	5	8	0	0	0	17	42
New Jersey:											
Camden	6		0	2	8	6	0	1	0	1	41
Newark	0	8	0	115	7	23	0	6	0	62	148
Trenton	0	1	0	41	5	13	0	0	0	12	49
Pennsylvania:											
Philadelphia	7	7	7	16	54	58	0	20	1	124	586
Pittsburgh	2	7	5	621	33	45	0	18	0	20	218
Reading	0		0	23	1	8	0	0	0	1	30
Scranton	1			385		2	0		0	4	
Ohio:											
Cincinnati	5	1	0	1	20	28	0	11	0	0	168
Cleveland	10	76	3	210	16	47	0	15	0	38	202
Columbus	6	3	3	125	5	34	0	3	0	4	99
Toledo	1	3	1	37	6	20	0	2	0	2	58
Indiana:											
Fort Wayne	4		1	33	1	6	0	0	0	0	26
Indianapolis	11		0	35	19	34	0	4	0	13	
South Bend	0		0	14	3	10	0	0	0	0	16
Terre Haute	2		0	0	0	0	0	0	0	0	16
Illinois:											
Chicago	11	14	5	929	68	569	0	41	1	58	739
Springfield	0		0	14	2	11	0	0	0	4	31
Michigan:											
Detroit	3	11	8	658	54	106	0	23	0	94	333
Flint	1		0	618	6	15	0	2	0	10	40
Grand Rapids	0		1	52	5	7	0	0	0	9	45
Wisconsin:											
Kenosha	0		0	300	0	14	0	0	0	18	13
Milwaukee	0		0	621	6	225	0	4	0	34	129
Racine	0		0	23	0	8	1	0	0	4	6
Superior	0		0	309	0	0	0	0	0	0	9
Minnesota:											
Duluth	1		1	425	4	2	0	1	0	0	32
Minneapolis	1		0	1,678	5	60	0	2	0	17	106
St. Paul	0		0	6	8	27	0	0	0	5	62

City reports for week ended Mar. 2, 1935—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Iowa:											
Davenport	1			2	---	0	0	---	0	0	---
Des Moines	1			37		7	0	---	0	0	41
Sioux City	1		0	14	0	2	0	0	0	2	0
Waterloo	1			7		7	0	---	0	0	---
Missouri:											
Kansas City	2	1	0	165	10	19	0	5	0	2	98
St. Joseph	2		0	9	6	1	0	0	0	0	33
St. Louis	24	---	0	10	21	22	0	14	0	2	261
North Dakota:											
Fargo	0		0	0	1	17	0	1	0	2	7
Grand Forks	0		---	---	---	0	0	---	0	0	---
South Dakota:											
Aberdeen	0		---	6	---	0	0	1	0	0	---
Nebraska:											
Omaha	1		1	22	8	7	1	0	0	0	63
Kansas:											
Topeka	0	---	0	45	4	3	0	0	0	6	17
Wichita	2	---	0	175	6	4	0	0	0	0	22
Delaware:											
Wilmington	0		0	4	9	17	0	0	0	3	20
Maryland:											
Baltimore	1	20	8	10	35	52	0	10	2	21	245
Cumberland	0		0	16	1	3	0	0	0	0	13
Frederick	1		0	0	0	1	0	0	0	0	2
District of Columbia:											
Washington	19	3	2	13	29	55	0	10	0	5	197
Virginia:											
Lynchburg	3		1	195	1	1	0	1	0	3	17
Norfolk	0	3	0	14	6	4	0	1	0	3	36
Richmond	1		1	124	10	7	0	6	0	0	68
Roanoke	1		1	18	1	3	0	1	0	0	20
West Virginia:											
Charleston	0	---	0	21	0	1	1	0	0	6	9
Huntington	1	---	---	17	---	5	0	---	0	0	---
Wheeling	0	---	0	135	3	24	0	0	0	7	22
North Carolina:											
Raleigh	---	---	---	---	---	---	---	---	---	---	---
Wilmington	0	---	0	1	1	0	0	0	0	3	7
Winston-Salem	0	1	0	6	0	2	0	0	0	32	12
South Carolina:											
Charleston	0	43	0	2	8	0	0	4	0	1	31
Columbia	0	---	0	0	3	0	0	1	0	0	13
Greenville	0	---	0	0	3	0	0	0	0	0	7
Georgia:											
Atlanta	2	50	8	2	14	6	0	5	0	2	95
Brunswick	0	---	0	0	0	0	0	0	0	0	2
Savannah	0	41	1	0	3	0	0	3	0	1	31
Florida:											
Miami	0	---	0	0	3	1	0	4	0	1	56
Tampa	2	---	0	4	4	2	0	2	0	0	29
Kentucky:											
Ashland	1	23	0	0	0	0	0	0	0	3	0
Lexington	0	---	0	20	6	1	0	2	0	0	18
Louisville	2	22	1	313	14	6	0	3	0	14	84
Tennessee:											
Memphis	4	---	8	2	13	9	0	2	2	4	92
Nashville	0	---	2	2	18	3	0	4	0	5	65
Alabama:											
Birmingham	2	40	6	34	10	2	0	7	0	6	75
Mobile	1	1	2	2	1	0	0	1	0	0	18
Montgomery	2	34	---	11	---	0	0	---	0	2	---
Arkansas:											
Fort Smith	---	---	---	---	---	---	---	---	---	---	---
Little Rock	1	---	0	23	8	2	0	1	0	0	11
Louisiana:											
New Orleans	16	6	7	1	18	6	0	16	1	0	199
Shreveport	1	---	0	20	13	0	0	5	0	8	41
Oklahoma:											
Tulsa	0	---	---	0	---	4	0	---	0	4	---
Texas:											
Dallas	6	5	3	0	14	2	0	8	0	0	74
Fort Worth	0	---	2	---	15	5	0	0	0	0	52
Galveston	1	---	0	0	1	1	0	1	0	0	13
Houston	3	---	1	3	12	0	0	9	0	0	86
San Antonio	0	0	8	2	8	2	0	8	0	0	50

City reports for week ended Mar. 2, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Montana:											
Billings	1		0	5	0	2	0	0	0	0	7
Great Falls	1		0	118	0	0	3	0	0	8	5
Helena	0		0	71	2	0	0	0	0	2	5
Missoula	0		0	0	0	0	0	0	0	5	7
Idaho:											
Boise	0		0	1	1	0	0	1	0	0	11
Colorado:											
Denver	10	41	0	306	8	187	0	4	0	0	72
Pueblo	0		0	109	2	5	0	1	0	1	14
Utah:											
Salt Lake City	0		3	3	4	62	0	3	0	54	58
Nevada:											
Reno	0		0	0	0	1	0	0	0	0	0
Washington:											
Seattle	0		2	42	5	8	2	7	0	5	91
Spokane	0	1	1	145	0	3	1	1	0	3	36
Tacoma	0		0	0	3	3	5	0	0	0	24
Oregon:											
Portland	0		0	68	5	11	0	2	0	0	100
Salem	0	3		1		0	0		0	0	
California:											
Los Angeles	12	71	6	23	27	72	1	25	0	9	367
Sacramento	10		0	40	1	6	0	1	0	0	31
San Francisco	0	7	1	8	8	25	0	8	0	13	160

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts:			
Boston	1	0	0
Worcester	1	1	0
New York:			
New York	12	2	0
Pennsylvania:			
Philadelphia	2	0	0
Ohio:			
Cincinnati	13	10	0
Toledo	1	0	0
Indiana:			
Indianapolis	3	1	0
Illinois:			
Chicago	11	1	0
Springfield	1	0	0
Michigan:			
Detroit	1	0	0
Minnesota:			
Minneapolis	2	1	0
Iowa:			
Davenport	1	0	0
Sioux City	5	0	0
Missouri:			
Kansas City	2	0	0
St. Louis	4	1	0
Nebraska:			
Omaha	2	4	0

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Kansas:			
Wichita	1	0	0
Maryland:			
Baltimore	4	1	1
District of Columbia:			
Washington	6	2	0
North Carolina:			
Wilmington	1	1	0
Kentucky:			
Ashland	1	0	0
Lexington	1	1	0
Tennessee:			
Memphis	4	0	1
Nashville	2	1	0
Alabama:			
Birmingham	1	1	0
Montgomery	1	0	0
Oklahoma:			
Tulsa	4	0	0
Texas:			
Dallas	4	0	0
Forth Worth	2	1	0
Houston	1	0	0
Washington:			
Seattle	0	0	1
California:			
Los Angeles	1	1	3

Epidemic encephalitis.—Cases: New York, 1; Newark, 1; Chicago, 1; St. Louis, 1; Miami, 1; Spokane, 1; San Francisco, 1.

Pellagra.—Cases: Philadelphia, 1; Norfolk, 1; Winston-Salem, 1; Charleston, S. C., 1; Atlanta, 2; Savannah, 1; Dallas, 1; San Francisco, 1.

Typhus fever.—Savannah, 2 cases.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended February 23, 1935.—During the 2 weeks ended February 23, 1935, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis		1	1	2		3				7
Chicken pox		6	4	289	694	58	76	20	102	1,249
Diphtheria		3	1	37	14	14	5			74
Dysentery				5	4					9
Erysipelas		1		10	8	1	1	1	6	28
Influenza		76	1	34	430	1			167	709
Measles		147	11	930	3,406	651	500	17	97	5,759
Mumps		31			666	33		11	49	790
Pneumonia		11			65		6		30	112
Scarlet fever	1	10	14	283	325	40	33	21	47	774
Smallpox					1					1
Trachoma						1	2			3
Tuberculosis	5	2	8	116	100	16	2	6	35	290
Typhoid fever				19	9	2			1	31
Undulant fever				1	4					5
Whooping cough	3	8	3	188	367	78	28	3	115	793

JAMAICA

Communicable diseases—4 weeks ended February 23, 1935.—During the 4 weeks ended February 23, 1935, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox	2	11	Puerperal fever	1	5
Dysentery	6	3	Tuberculosis	31	74
Erysipelas		2	Typhoid fever	8	32
Leprosy		3			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Feb. 22, 1935, pp. 267-279. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Mar. 29, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Ceylon—Colombo - During the week ended February 23, 1935, 2 cases of cholera were reported at Colombo, Ceylon.

Persia—Bushire.—During the week ended March 2, 1935, 4 cases of cholera with 3 deaths were reported at Bushire, Persia.

Siam—Nagara Rajsima—Roy Ech.—During the week ended March 2, 1935, 13 cases of cholera with 2 deaths were reported at Roy Ech, Nagara Rajsima, Siam.

Plague

Canary Islands—Las Palmas.—During the week ended January 19, 1935, 1 case of plague was reported at Las Palmas, Canary Islands.

China—Amoy.—On February 24, 1935, 1 imported fatal case of plague was reported at Amoy, China.

Dutch East Indies—Cheribon.—During the week ended February 23, 1935, 1 imported fatal case of plague was reported at Cheribon, Dutch East Indies.

Egypt—Asyut.—During the week ended March 2, 1935, 1 case of plague with 1 death was reported at Asyut, Egypt.

Siam—Rajpuri.—During the week ended March 2, 1935, 1 case of plague was reported at Rajpuri, Siam.

Smallpox

Ceylon—Welitara.—A report dated March 7, 1935, states that from January 31, 1935, 20 cases of smallpox had been reported at Welitara, Ceylon.

Typhus Fever

China—Tientsin.—During the week ended January 19, 1935, 1 case of typhus fever was reported at Tientsin, China.

Colombia.—During the week ended January 19, 1935, 1 death from typhus fever was reported at Colombia.

Yellow Fever

Colombia—Intendencia of Meta—Restrepo.—During the week ended January 26, 1935, 3 deaths from yellow fever were reported at Restrepo, Intendencia of Meta, Colombia.

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg Gen R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 39; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 50 MARCH 29, 1935 NO. 13

THE URINARY EXCRETION OF SILICA BY PERSONS EXPOSED TO SILICA DUST

By J. J. BLOOMFIELD, *Sanitary Engineer*, R. R. SAYERS, *Senior Surgeon*, and F. H. GOLDMAN, *Associate Chemist, United States Public Health Service*

It has been demonstrated by numerous researches that silicosis is caused by the inhalation of silica dust. Not only has an excessive amount of silicosis been found associated with an exposure to such dust, but autopsy material has furnished additional proof, in that it has been possible to recover excessive amounts of silica in the ash of the lungs of silicotic persons. More recently, King (*1*) has demonstrated, as a result of his work on the metabolism of silica, that the urinary excretion of silica is at a higher level in persons exposed to silica dust than in normal individuals. King says, in part: "In the case of human beings it is probable that large numbers of extremely fine particles, smaller even than the very fine particles observable under the microscope in the lungs of individuals exposed to a dusty atmosphere, are constantly finding their way into the lung. In contact with the fluid in the lung these smallest of particles may suffer rapid solution, the larger particles slower and only partial solution. In this way there may be constant drainage of silica from the lung, the dissolved silica being carried away by the blood to be excreted in the urine."

The present brief study was undertaken for the purpose of obtaining further evidence that the lung changes associated with the inhalation of dust in the anthracite coal industry are caused by an exposure to both coal and silica dust. In a recent study of the health of workers in the anthracite coal industry (*2*) conducted by the Office of Industrial Hygiene and Sanitation of the Public Health Service, it was found that the workers were subjected to the inhalation of dust varying in total silica content from 11 to 63 percent, and in quartz content ranging from 4 to 43 percent. Pathological studies of some of these workers showed their lungs to contain silica and carbonaceous material in excess of the amounts present in

normal lungs. All the evidence gathered seemed to point to the fact that the condition found among these workers may be attributed in part to the silica dust to which they were exposed; and as a result of these findings this condition in the anthracite workers was termed "anthraco-silicosis." It was felt, therefore, that the recovery of excessive amounts of silica in the urine of these mine workers, whose silica dust exposure had been established in a quantitative manner, would furnish further proof of the abnormal intake of silica dust.

PLAN OF STUDY

The present study was conducted on a group of men whose exposure had been previously evaluated as to the composition, size, and quantity of dust, and whose years of trade life were also known. Table 1 shows the distribution of the men in the different occupations entailing varying degrees of exposure to silica dust in the mines studied.

TABLE 1.—*Distribution of mine workers examined for urinary silica excretion*

Occupational group	Number of men	Silica dust exposure, percent	
		Total silica	Quartz
Miners	36	11.1	3.1
Rock workers	24	63.2	35.2
Inside transportation men	20	33.7	13.0
Outside workers	23	13.5	4.3
Former miners	20	11.1	3.1
Total	123		

Urine specimens were collected in most cases in 2-quart capacity cans and were immediately analyzed for silica at the mines by the method described by King and Dolan (*1*). Of the 123 samples obtained, 73 (59 percent) were 24-hour specimens. Specific gravity, albumin, and sugar were included in the analysis.

RESULTS OF STUDY

The silica content of the urine in milligrams per 100 cc varied from 0.6 to 11.7 and averaged 2.5. Urine specimens of 11 laboratory and office workers were analyzed for control purposes and showed an average silica content of 1.0 milligram per 100 cc. These findings are in agreement with those reported by King and Dolan. Through the courtesy of Assistant Sanitary Engineer J. M. DallaValle, of this Office, it was possible to examine 20 specimens of urine from steel-foundry workers. The results of these analyses showed the foundry workers to be excreting an average of 2.6 milligrams of silica per 100 cc. The specific gravity determinations showed no relationship to the silica

content of the urine. This result is also in agreement with King's work on the excretion of silica by gold miners.

In the study of the health of anthracite coal workers it had been possible to obtain excellent correlations between clinical findings and the composition and amount of dust, together with the years of exposure, when the latter three factors were expressed in one term; namely, silica particles-years. Consequently, a similar procedure was used in an attempt to determine the relationship between the total silica dust exposure and the amount of urinary silica. The results of such an analysis are presented in table 2.

TABLE 2.—*The relationship between the silica dust exposure of anthracite coal workers and urinary silica*

Exposure in millions of silica-dust particles-years	Milligrams of silica excreted per 100 cc of urine										Average silica excretion per 100 cc urine
	Number of persons in each group					Percent of persons in each group					
	Less than 1.0	1-1.9	2-2.9	3 or more	Total	Less than 1.0	1-1.9	2-2.9	3 or more	Total	
Less than 500	14	22	12	8	56	25	39	21	15	100	1.7
500-999	1	2	7	4	14	7	14	50	29	100	2.9
1,000-1,999	2	6	0	9	17	12	35	0	53	100	3.4
2,000 or more	0	6	3	7	16	0	38	19	43	100	3.6

It appears from these results that there is a definite relationship between the amount of silica dust inhaled over a period of years and the urinary silica found in the workers. The actual correlation is 0.48, and the probable error 0.04. It is interesting to note that aside from the gradual increase in urinary silica with an increase in exposure, as shown in the last column, no person with an exposure to more than 2,000 million silica dust particles-years was excreting less than the amount of silica found in normal persons (1.0 milligrams per 100 cc of urine), and that 62 percent of the workers in this group were excreting silica in excess of 2.0 milligrams per 100 cc. On the other hand, 64 percent of the persons with an exposure to less than 500 million silica particles-years were excreting silica in their urine in amounts less than 2.0 milligrams per 100 cc.

Table 1 indicated that 20 former miners were included in this study. These men were residing in a sanatorium for chronic diseases; and since they were all living under similar conditions, the factor of diet, which was shown by King to influence the urinary silica excretion, would not enter into the present picture. These former mine workers were found to have had an exposure to anthracite coal dust averaging 37 years and had been out of the industry an average of 7 years. The average urinary silica of these men was 2.1 milligrams per 100 cc, and was greater than the amounts found in non-miners at the same

institution. This finding is also in agreement with that of King and Dolan, who obtained corresponding data on a group of 6 gold miners not exposed to dust at the time of examination. The anthracite mine workers who had been free from dust exposure for less than 5 years were found to be excreting slightly more silica than those who had been away from the industry for a longer period.

The present brief inquiry does not furnish sufficient data to determine the value of the urinary silica examination as an aid in the diagnosis of anthraco-silicosis. Excessive silica excretion probably merely indicates an abnormal intake of silica. It does, however, furnish additional evidence of the etiology of the disease.

SUMMARY

One hundred and twenty-three anthracite coal workers, 20 of whom had been out of the industry an average of 7 years, were examined for urinary silica by the method of King and Dolan. The amounts of silica found in the urine varied from 0.6 to 11.7, and averaged 2.5 milligrams per 100 cc. Normal individuals were found to be excreting only an average of 1.0 milligram per 100 cc. A close correlation was found between the silica dust exposure of these men for a specified number of years and the amount of urinary silica. A study of former anthracite coal workers showed that even after a lapse of several years away from any silica dust exposure, an increased amount of silica is being excreted by them. These findings furnish additional evidence of the etiology of the disease.

REFERENCES

(1) King, Earl J., and Dolan, Margery: Silicosis and the metabolism of silica. The Canadian Medical Association Journal, Vol. 31, pp. 21–26. 1934.
(2) Public Health Bulletin, U. S. Public Health Service. In preparation.

MOTTLED ENAMEL IN TEXAS

By H. Trendley Dean, *Dental Surgeon, United States Public Health Service,* and R. M. Dixon, *District Sanitary Engineer,* and Chester Cohen, *Principal Assistant Engineer, Texas State Department of Health*

INTRODUCTION

Since 1916 there have been occasional references (1), (2), (3), (4), in the literature inviting attention to the presence of mottled enamel in west Texas. In 1932 (5) a detailed questionnaire survey by the United States Public Health Service indicated that the Panhandle-west Texas region was probably the largest mottled enamel area in the United States with more people affected. This report showed that there were at least 26 west Texas counties in which mottled

enamel was endemic and that such large centers of population as the cities of Amarillo, Lubbock, and Plainview were seriously affected. In addition, the possibilities of other affected areas in Texas became evident when mottled enamel was reported as endemic at Taylor, in Williamson County. Lemmon (6), a pediatrician, has recently called to the attention of the Texas medical profession the relationship between mottled enamel and child hygiene and nutrition.

METHOD OF SURVEY

This survey was a cooperative study made by the United States Public Health Service and the Texas State Department of Health during November and the early part of December 1934. Each of the communities hereinafter referred to was visited, and subsequently, with the cooperation of the local superintendent of education, school children, generally of the fourth, fifth, and sixth grades, were examined. A total of 66 cities, towns, or rural communities in 44 counties was visited and 3,723 school children were examined. The purpose of the survey was to obtain general information relative to the extent of the affected territory and a rough index of the degree of severity of the mottled enamel being produced.

Upon visiting a classroom, the purpose of the survey was first explained, and those children who had lived in the community continuously since birth and who had always used the city water for domestic purposes (cooking and drinking) were assembled in a separate group. This group was further questioned to determine whether there had been any breaks in the continuity of their residence and water consumption. Under good illumination each child was examined by one of us (H. T. D.) and the presence or absence of mottled enamel recorded. The degree of severity was noted in accordance with a standard of classification previously described (7). In many instances the children with variable residences and water histories were likewise examined under the same conditions.

The basis upon which the various degrees of motlle enamel were classified is, briefly, as follows:

NORMAL (FIG. 1)

The enamel presents the usual translucent semivitriform type of structure. The surface is smooth, glossy, and usually of a pale, creamy white color. In addition to those teeth showing normal calcification, for purposes of mottled enamel classification there is also included under this heading all individuals with permanent teeth showing hypoplasias *other* than mottled enamel. Such hypoplasias of the enamel are, in the main, those characteristic of Hutchinson's teeth and the hypoplasias concomitant with the exanthematous diseases and nutritional disturbances during the period of the enamel development of the permanent teeth. If an examination of a person reveals the presence of one of the previously mentioned hypoplasias *and* mottled enamel, the examination is recorded solely

on the basis of the mottled enamel present and is listed under its proper mottled enamel classification.

QUESTIONABLE (FIG. 2)

In areas of relatively high endemicity, over 75 percent, there are at times cases which the experienced investigator occasionally hesitates to classify either as apparently normal or very mild. Such cases are listed as questionable. In studying a "border line" area, or a community where the causative factor of mottled enamel is present in the water supply quantitatively somewhere between the maximum harmless amount and the minimum capable of producing the "very mild" and "mild" type of mottled enamel in 35 percent or more of the children who have used the particular water exclusively from birth, this classification is frequently needed. In such areas there is generally a higher percentage of individuals classed as normal than the combined group of "very mild" and "mild." There is, however, always a certain percentage of those individuals with comparable histories, that discloses slight aberrations in the translucency of normal enamel ranging from a few white flecks to occasional white spots. Furthermore, in some instances, thin, irregular, white, opaque streaks, or veining, are noted on the incisal third of the superior incisors. In other cases the tip of the summit of the bicuspids shows an unusual white opacity two or three millimeters in extent, the remainder of the tooth being apparently normal. As such cases are not sufficiently developed to be classed as "very mild", and are definitely not "normal", they are listed as questionable.

VERY MILD (FIG. 3)

Small, opaque, paper-white areas are scattered irregularly or streaked over the tooth surface. This mottling is principally observed on the labial and buccal surfaces and involves up to 25 percent of the tooth surface of the particular teeth affected. Small, pitted, white areas are frequently found on the summit of the cusps. Brown stain is rarely observed in the mottled enamel of this classification and, if present at all, is so faint as to be almost indistinct.

In areas of high endemicity, mottled enamel is not infrequently observed on the deciduous molars and occasionally the deciduous cuspids. Mottled enamel in deciduous teeth is generally of the very mild type, even though the permanent teeth in the same individual may show moderate to severe mottling.

MILD (FIG. 4)

The white opaque areas in the enamel of the teeth involve at least half of the tooth surface. The surfaces of molars, bicuspids, and cuspids subject to attrition show thin white layers worn off and the bluish shades of underlying normal enamel. Light brown stains are sometimes apparent, generally on the superior incisors.

MODERATE (FIGS 5 AND 6)

No change is observed in the form of the tooth, but generally all tooth surfaces are involved. Surfaces subject to attrition are definitely marked. Minute pitting is often present, generally on the labial and buccal surfaces. Brown stain is frequently a disfiguring complication. For the most part the stain ranges from tan to chocolate in color and not infrequently involves as much as half of the labial surface. It must be remembered, however, that the incidence of brown stain varies greatly in different endemic areas and many cases of white opaque mottled enamel, without brown stain, are classified as "moderate" and listed in this category.

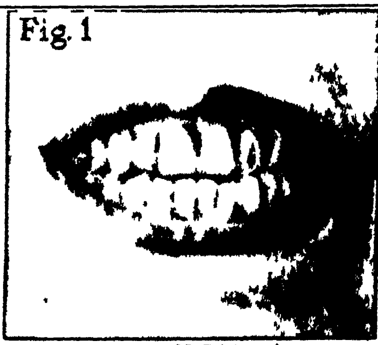


Fig. 1

NORMAL *

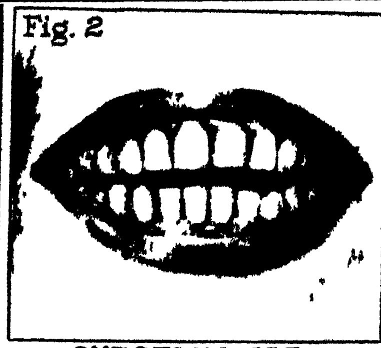


Fig. 2

QUESTIONABLE

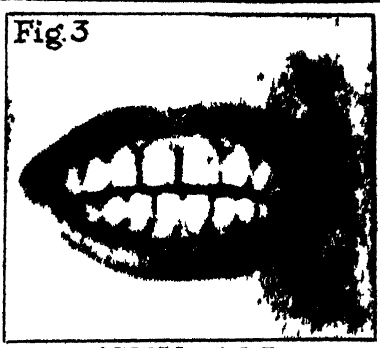


Fig. 3

VERY MILD

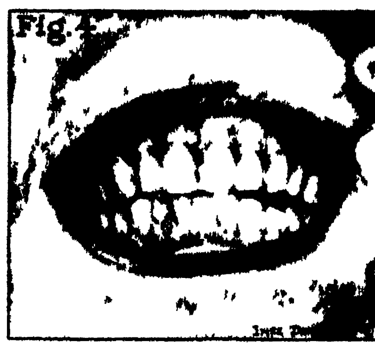
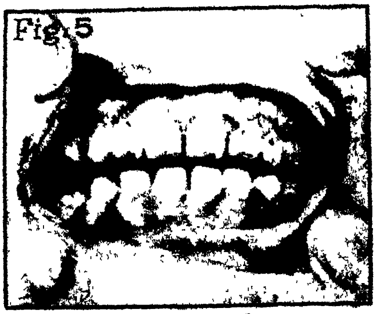


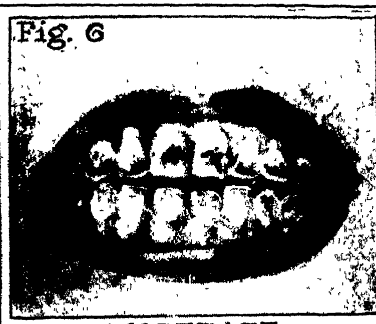
Fig. 4

MILD

* THE APPARENT WHITE SPOTS ON THE LABIAL AND BUCCAL SURFACES IN THIS REPRODUCTION (NORMAL) DEPICT "HIGH LIGHTS" AND ARE NOT MOTTLED ENAMEL.

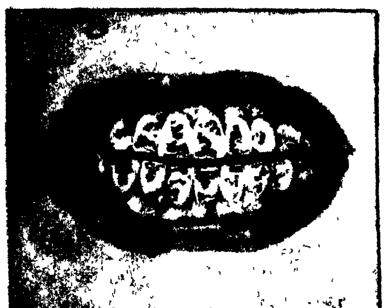


MODERATE
White opaque

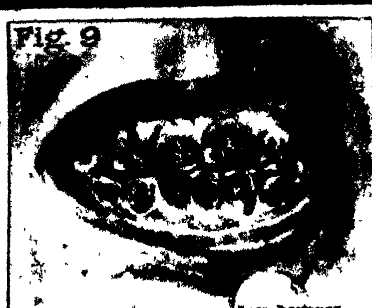


MODERATE
Brown stain.

MODERATELY SEVERE
Discrete pitting.



SEVERE
Confluent pitting



SEVERE
Brown stain

MODERATELY SEVERE (FIG. 7)

Macroscopically a greater depth of enamel appears to be involved. A smoky white appearance is often noted. Pitting is more frequent and generally observed on all tooth surfaces. The pits are discrete and may be 1 to 2 millimeters in diameter. Brown stain, if present, is generally deeper in hue and involves more of the tooth surface. The diagnostic sign of this classification is, however, the discrete pitting.

SEVERE (FIGS. 8 AND 9)

The hypoplasia is so marked that the form of the teeth is at times affected; the older children often present a mild incisal-occlusal pathological abrasion. The pits are deep and very often confluent. As a result of confluent pitting, which is the diagnostic sign of this classification, the outer surface of the enamel is lost in places and the tooth often presents a corroded-like appearance. Stains are widespread and range in color from chocolate brown to almost black.

MOTTLED ENAMEL INDEX OF A COMMUNITY

The various degrees of mottled enamel severity having been defined, the application of this classification to the determination of a mottled enamel index of a community is necessary for epidemiological purposes and subsequent correlation with chemical and other studies.

Accordingly the following indexes have been arbitrarily defined in terms of the degree of severity of mottled enamel observed clinically:

NEGATIVE: When less than 10 percent of the children show "very mild" or more severe types of mottled enamel.

BORDER LINE: When 10 percent or more, but less than 35 percent, show "very mild" mottled enamel or worse.

SLIGHT: 35 percent or more show "very mild" or worse, but less than 50 percent are mild or worse, and less than 35 percent "moderate" or worse.

MEDIUM: 50 percent or more are mild or worse, but less than 35 percent are "moderate" or worse.

RATHER MARKED: 35 percent or more, but less than 50 percent are "moderate" or worse, but less than 35 percent are "moderately severe" or worse.

MARKED: 50 percent or more are "moderate" or worse, but less than 35 percent are "moderately severe" or worse.

VERY MARKED: 35 percent or more are classified as "moderately severe" or worse.

All children included in a group utilized in the determination of a mottled enamel index of a community refer to children whose time of risk of exposure had been constant, meaning that the children were born in the community, had lived there all their lives (short vacations totaling less than 30 days in one calendar year excepted), and had always used the municipal or common water supply for cooking and drinking purposes. In certain west Texas communities the mottled enamel index could be determined only tentatively at this time. The reason for a tentative index will be made apparent in the section dealing with the factor of population influx.

FACTOR OF POPULATION INFLUX

The factor of population changes and its relation to changes of water supply are obviously of paramount importance in mottled enamel investigation. The pertinent facts concerning population movements have a direct bearing on the west Texas survey. There has been a rapid growth and development of west Texas during the period between 1920 and 1930. The marked migration into west Texas during this decade is well illustrated by an examination of the reports of the Bureau of the Census (8). The percentage increase in

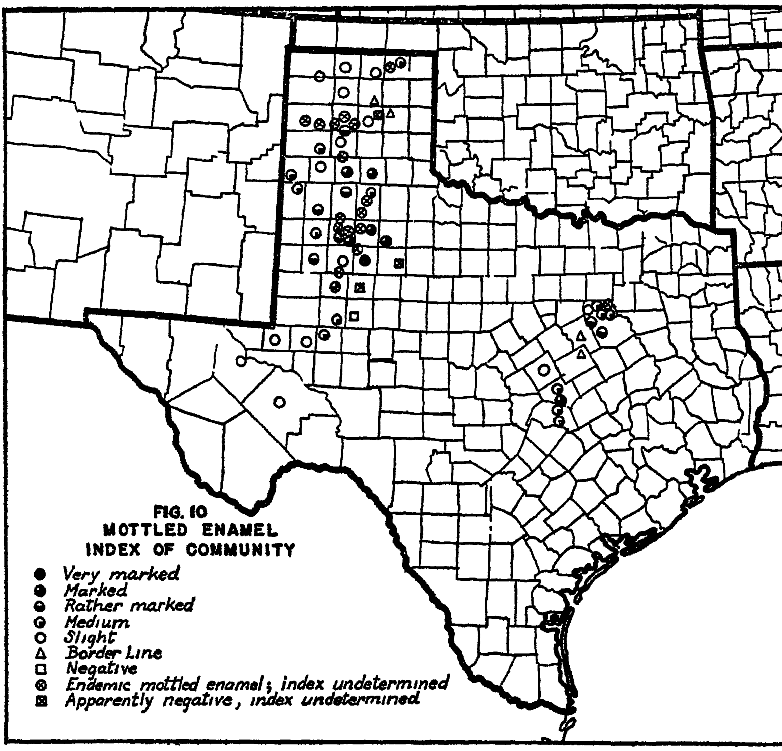


FIG. 10
MOTTLED ENAMEL
INDEX OF COMMUNITY

population between 1920 and 1930 for the State of Texas was 24.9, while the population of the 37 west Texas counties covered by this report increased from 138,851 in 1920 to 379,881 in 1930, or 173.6 percent.

As a result of the unusual increase in population in west Texas during the period between 1920 and 1930, a large number of children disclosed histories of residence in nonendemic and endemic areas, or of having lived continuously since birth in a community where the municipal water supply had been installed or changed during the life of the child. It was not infrequent to find that smaller cities or

towns had installed municipal water only as late as 6 to 8 years ago; previous to that time the few inhabitants depended on individual windmill wells.

In all of such places the attempt was made to determine whether the municipal water supply was producing mottled enamel by an examination of those children in the fifth and sixth grades who had used the municipal water exclusively for at least the past 6 years. In such groups the examination was limited to the cuspids, bicuspids, and second molar teeth, and the presence or absence of mottled enamel recorded on the basis of these observations. Under such conditions the mottled enamel index given to such communities is necessarily tentative. Each community should be resurveyed 3 or 4 years hence to determine its actual or approximate mottled enamel index.

WATER SUPPLIES

In the west Texas phase of the survey, another of us (R. M. D.) obtained all relative data available concerning the municipal supply from the local water superintendent, and collected one or more samples of the supply. When the municipal supply was a composite water from more than one stratum, two or more samples were collected whenever possible. These samples were forwarded to the Texas State Department of Health in whose laboratories the fluoride determinations are being made. The report of the chemical determination of these waters associated with endemic mottled enamel will be made the basis of a separate report. The information included in this report regarding municipal water supplies of the affected communities in the east central Texas area has been obtained by another of the authors (C. C.).

In west Texas there are apparently three strata of water-bearing sands, in general not widely separated in depth. Practically all wells in this region are drilled, and it is customary to refer to drilled wells obtaining water from the first stratum as "shallow," and from the second or third stratum as "deep." Consequently in one county the term "shallow" may be applied to a 300-foot drilled well because water from the second or third stratum is not obtained until a depth of 450 or 500 feet is reached, while in another county, the term "deep" well may be applied to a 125-foot well because the first stratum of water in that particular locality is reached at 80 feet.

SURVEY FINDINGS

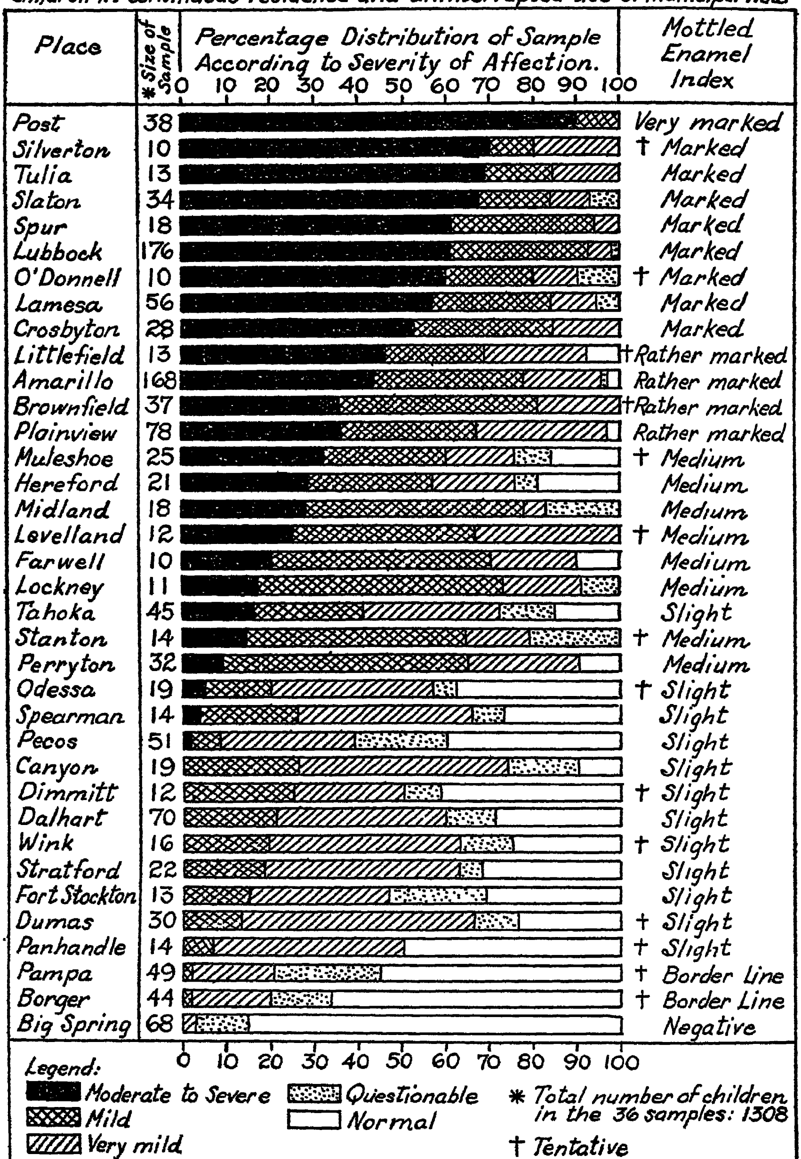
The results of this survey are summarized as follows:

Table 1 details the mottled enamel findings and history of common water supplies in certain cities of the Panhandle, west Texas, and

FIG. II

SEVERITY OF MOTTLED ENAMEL IN CHILDREN OF CERTAIN SELECTED PLACES OF THE PANHANDLE AND WEST TEXAS

Children in continuous residence and uninterrupted use of municipal water

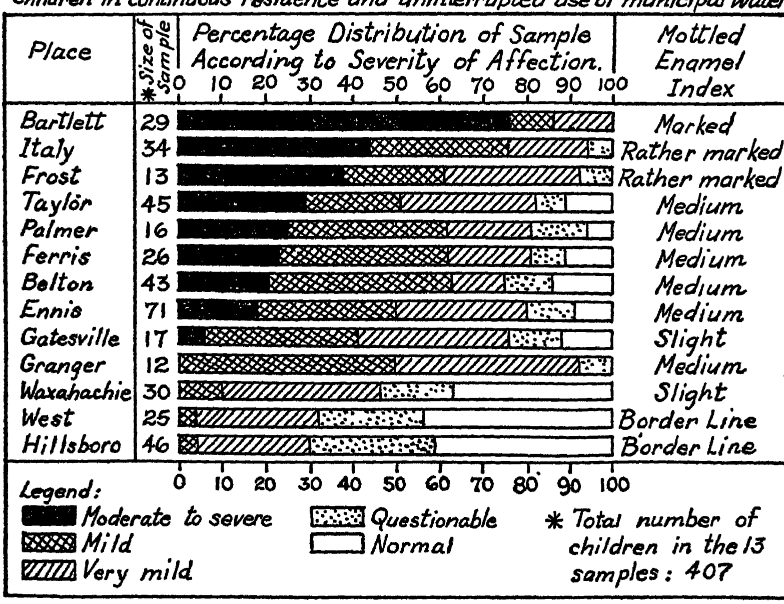


east central Texas. In these cities a sufficient number [1] of children with a history of continuous residence and constant use of the city water were examined to warrant the development of an approximate [2] or tentative mottled enamel index of the community. Figures 11 and 12 illustrate the percentage distribution of that part of the sample having continuous residence and constant use of a common water supply listed according to severity of affection, and they also show either the approximate or tentative mottled enamel index of the community.

FIG. 12

SEVERITY OF MOTTLED ENAMEL IN CHILDREN OF CERTAIN SELECTED PLACES OF EAST CENTRAL TEXAS.

Children in continuous residence and uninterrupted use of municipal water



In table 2 are listed four small communities possessing municipal water supplies, but where an insufficient number of examinations were made to permit the computation of a mottled-enamel index.

Table 3 summarizes mottled enamel findings in certain communities and rural districts of the Panhandle and west Texas where common water supplies are either not available or, in two instances, not used.

[1] Ordinarily the mottled-enamel index of a community should not be determined unless the group examined consists of 25 or more children with a continuous residence since birth and a constant use of a common water supply. This minimum standard could not be adhered to in all instances in this survey owing to the factor of population changes or a smaller number of children available in the school showing a constant residence and water history.

[2] It should be noted that an "actual mottled enamel index" is not given a community unless all histories as given by the child, with respect to both residence and water supplies, are rechecked and confirmed by an interview with the child's parents.

Table 1.—*Summary of mottled enamel findings and history of water supply in certain cities of (1) Panhandle and west Texas and (2) east central Texas*

1. PANHANDLE AND WEST TEXAS

City and population (census of 1930)	Total number of children examined	Children classified according to mottled enamel diagnosis: (A) Continuous residence with constant use of city water							(B) Changes in residence and/or water history							History of water supply	Remarks
		Normal	Questionable	Very mild	Mild	Moderate	Moderately severe	Severe	Normal	Questionable	Very mild	Mild	Moderate	Moderately severe	Severe		
Post (1,668)	38	0	0	0	4	19	13	2	(1)	(1)	(1)	(1)	(1)	(1)	(1)	Present supply in constant use since prior to 1922; obtained from 13 wells 85 feet to 100 feet deep; apparently in first stratum.	Sample represents all children in the fourth, fifth, and sixth grades who used city water continuously. Post is located east of the cap rock, but the wells from which the supply is obtained are 3 to 4½ miles west of Post, and on the cap rock.
Silverton (873)	45	0	0	2	1	6	1	0	7	1	8	8	7	4	0	Obtained from 120 feet (1924) and 150 feet (1928) wells in first stratum, similar to local windmill wells. City supply in general use last 6 years only.	Entire sixth grade examined; "B" also includes some children from immediate rural districts.
Tulia (2,202)	61	0	0	2	2	8	1	0	7	2	12	13	13	1	0	From North well 168 feet (1922) and South well 60 feet (1925). Apparently first stratum. Most of water supply at present from the South well.	Entire sixth grade examined; "B" also includes children from immediate rural district.
Slaton (3,876)	34	0	2	3	6	19	3	1	(1)	(1)	(1)	(1)	(1)	(1)	(1)	From 1922–24, shallow wells, first stratum. Since 1924, 3 wells, 125, 135, and 210 feet. First 2 take water from first and second strata; third well from all 3 strata.	Sample represents all children of fourth, fifth, and sixth grades who used city water continuously.
Spur (1,899)	24	0	0	1	6	11	0	0	4	0	0	1	1	0	0	Municipal water supply is obtained from 3 wells, each 44 feet deep. Spur is located east of the cap rock, but is apparently drawing its water from the cap rock aquifer.	Sample under "A" represents all children in fifth and sixth grades with constant history. Four normals under "B" used cistern water exclusively.
Lubbock (20,520)	176	0	2	11	54	77	31	1	(1)	(1)	(1)	(1)	(1)	(1)	(1)	Municipal water obtained from 8 drilled wells with standard steel casing the entire depth, and averaging 98 to 150 feet.	Sample represents all white children in fourth, fifth, and sixth grades of public schools whose histories indicated constant use of city water since birth.

O'Donnell (1,026)	27	0	1	1	2	6	0	0	2	1	6	5	2	1	0	Obtained from seven 80-foot uncased wells, taking water from first stratum. 5 were drilled in 1928 and 2 in 1932. No common water supply prior to 1928.	"B" includes children from immediate rural district and "A" sample, all children third, fourth, and fifth grades who used city water past 5 years.
Lamesa (3,528)	56	0	3	6	15	23	9	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1921 to 1929 obtained from 3 wells, 90, 140, and 300 feet, respectively. Since 1929, 3 wells 140 feet, taking water from second stratum.	Sample represents all children in the third, fourth, and fifth grades who used city water continuously since birth.
Crosbyton (1,250)	28	0	0	4	9	14	1	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	From two 280-foot wells drilled in 1918 and 1930 and taking water from the second stratum.	Do.
Littlefield (3,218)	84	1	0	3	3	5	1	0	21	6	17	16	11	0	0	From four 120-foot wells drilled in 1926 and 1927, obtaining water from the first stratum. No common water supply prior 1926.	"A" sample represents all children in fifth and sixth grades who used city water continuously since installation.
Amarillo (43,132)	533	5	1	30	58	60	12	2	126	15	90	86	42	6	0	From 10 wells (1927) 180 feet deep and 5 (1931) 280-foot wells. Previous 1927 from thirty-five 250-foot wells located in various parts of the city.	Sample consists of entire fourth, fifth, and sixth grades in 3 white and 1 colored public schools.
Brownfield (1,907)	37	0	0	7	17	10	3	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	Since 1925 from 2 dug wells 103 and 117 feet, taking water from first stratum. Prior 1925 no municipal supply.	Sample represents all children in fourth, fifth, and sixth grades who used city water continuously since 1925.
Plainview (8,834)	78	2	0	24	24	26	2	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	From 3 wells 95, 175, and 275 feet. Prior to 1926 first 2 wells only were used; 1926–28 275-foot well used solely. Present supply composite of all 3 wells.	Sample represents children in fifth, sixth, seventh, and eighth grades, who used municipal water continuously since birth.
Muleshoe (779)	72	4	2	4	7	7	1	0	22	2	11	7	3	2	0	From 1 well (1927) 90 feet deep, obtaining water from first stratum and apparently comparable with many local windmill wells. No supply prior 1927.	"A" sample represents all children in fifth, sixth, and seventh grades, who used city water continuously for past 6 years.
Hereford (2,458)	92	4	1	4	6	4	2	0	11	8	15	16	18	3	0	From three 60-foot wells drilled in 1919, 1921, and 1925. Many individual windmill wells used prior to 1927 comparable in depth.	"B" sample includes many children using individual windmill wells, both city and immediate rural district.
Midland (5,484)	18	0	3	1	9	5	0	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	Since 1928 from 2 wells 130 feet; 1910–28, from wells approximately 90 feet.	Sample represents all children in fifth and sixth grades using city water continuously since birth.
Levelland (1,661)	77	0	0	4	5	3	0	0	16	8	15	13	12	1	0	From two 185-foot wells drilled 1928–29. Water obtained from second stratum; first stratum is cased off at 120 feet. No common water supply prior 1928.	"A" sample represents all children in fifth and sixth grades who used city water for past 6 years.
Farwell (647) [2]	52	1	0	2	5	2	0	0	20	2	13	5	2	0	0	Obtained from one 300-foot well drilled in 1922; due to perforated casing water is obtained from both strata. Same water supply is used in adjoining Texico, N. Mex.	"A" sample represents all children in fourth, fifth, sixth, and seventh grades who used city water continuously.
Lockney (1,466)	30	0	1	2	6	2	0	0	0	0	8	9	2	0	0	Obtained from one 120-foot well drilled in 1928, cased to the first stratum. Prior to 1928 municipal supply from a well same depth but not cased.	"B" sample represents children using windmill well water continuously from birth in Lockney and immediate rural district.

[1] None examined.

[2] Rand McNally pocket map of Texas, 1934.

TABLE 1.—*Summary of mottled enamel findings and history of water supply in certain cities of (1) Panhandle and west Texas and (2) east central Texas*—Continued

1. PANHANDLE AND WEST TEXAS—Continued

City and population (census of 1930)	Total number of children examined	Children classified according to mottled enamel diagnosis: (A) Continuous residence with constant use of city water							(B) Changes in residence and/or water history							History of water supply	Remarks
		Normal	Questionable	Very mild	Mild	Moderate	Moderately severe	Severe	Normal	Questionable	Very mild	Mild	Moderate	Moderately severe	Severe		
Tahoka (1,620)	58	7	6	14	11	7	0	0	2	2	0	3	5	1	0	From 11 wells 80 to 100 feet deep obtaining water from first stratum. First well drilled 1924; subsequent wells added as needed; 9 wells are "gravel backed."	"A" sample, all children in second, third, fourth, fifth, and sixth grades using city water continuously since birth. "B" sample, children from immediate rural district.
Stanton (1,384)	14	0	3	2	7	2	0	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	From 3 wells, 2 drilled 1927, 1 in 1930, each 135 feet; first stratum cased off. No common water supply prior to 1927.	Sample consists of children in fourth, fifth, and sixth grades using municipal water continuously since 1927.
Perryton (2,824)	137	3	0	8	18	3	0	0	38	9	33	21	4	0	0	From two 400-foot "gravel backed" wells installed 1927. City water is a composite from all 3 strata. Municipal supply in use since 1923.	Entire fifth and sixth grades, Perryton and rural school district.
Odessa (2,407)	32	7	1	7	3	1	0	0	7	1	1	3	1	0	0	From six 140-foot wells; 5 drilled 1928, 1 in 1933. No city water prior to 1928.	Both samples from third and fourth grades. "A" used city water constantly past 6 years. "B" used individual wells constantly since birth.
Spearman (1,580)	107	2	1	5	5	1	0	0	48	8	27	9	1	0	0	From two 350-foot wells drilled 1924 and 1927. Stratum from which water is obtained is unknown.	All of fifth and sixth grades examined, Spearman and rural school district.
Pecos (3,304)	51	20	11	16	3	1	0	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	From 2 wells 280 feet deep drilled 1914. The first stratum is cased off.	Sample consists of all children in third, fifth, sixth, and seventh grades using city water exclusively since birth.
Canyon (2,821)	89	2	3	9	5	0	0	0	15	6	15	16	16	2	0	Since 1928 from 500-foot well of West Texas Utility Co. Prior to 1928 from 4 city wells, 250 to 500 feet. No data procured on stratum or strata from which these waters were and are obtained.	In sample "B" there were 14 children from immediate rural district who always used water from individual windmill wells. They show a more severe type of mottled enamel than those using Canyon city water.
Dimmitt (829)	53	5	1	3	3	0	0	0	12	6	6	10	5	2	0	From one 230-foot well drilled 1927. No data on stratum from which water is obtained. Prior to 1927 there was no common water supply.	"A" sample represents all children in fifth and sixth grades using city water constantly for past 6 years. In sample "B" there were 9 children from imme-

																	diate rural district who from birth continuously used water from individual wells. All showed a more severe type of mottled enamel than those using Dimmitt city water.
Dalhart (4,691)	248	20	8	27	15	0	0	0	100	8	43	22	5	0	0	From 2 wells 340 feet deep, drilled 1923. Prior 1928 water obtained from wells of similar depth.	Examinations were made of children in fourth, fifth, and sixth grades.
Wink (3,963)	16	4	2	7	3	0	0	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	From 5 wells 220 feet deep, drilled 1927; first stratum is cased off. At present only 1 well is being used. No common water supply prior 1927.	Sample taken from fourth grade, none over 10 years of age and had used city water for at least past 6 years.
Stratford (873)	76	7	1	10	4	0	0	0	27	10	10	6	1	0	0	From the 302-foot well, drilled 1930, and owned by the West Texas Utility Co. No information obtained concerning previous municipal supply.	Examinations included all children of fourth, fifth, and sixth grades.
Fort Stockton (2,695)	13	4	3	4	2	0	0	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	From 175-foot well, drilled 1927. Between 1923–30 water was obtained from 2 wells 306 and 365 feet. These wells were abandoned in 1930. Between 1927–30 the supply was composite of all wells.	Sample represents all children in fourth fifth, and sixth grades who used city water continuously.
Dumas (700) [2]	86	7	3	16	4	0	0	0	39	4	9	3	1	0	0	From 2 wells 530 and 550 feet, installed in 1930. No information regarding stratum from which water is obtained.	All children in the fourth and fifth grades were examined.
Panhandle (2,035)	42	7	0	6	1	0	0	0	10	5	8	5	0	0	0	From 2 wells each 550 feet, installed 1927. No information on stratum from which water is obtained. No common water supply prior 1927.	All children in sixth grade examined. "A" sample represents children using city water for the past 6 years.
Pampa (10,470)	117	27	12	9	1	0	0	0	46	9	10	3	0	0	0	Present supply from 3 wells, 384 feet, cased entire depth, and taking water from third stratum. There are 6 other wells not being used at present.	All children in sixth grade examined. "A" sample represents children using city water for the past 6 years or longer.
Borger (6,532)	124	29	6	8	1	0	0	0	57	10	10	3	0	0	0	From wells 250 to 500 feet, located 18 miles south in Carson County (Plain Station) and installed 1928. No common water supply prior 1928.	All of fifth and sixth grades examined. "A" sample represents children using city water for the past 6 years.
Big Spring (13,735)	68	58	8	2	0	0	0	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	Municipal supply consists of 23 wells. One-third of supply from 13 wells 260 feet, drilled in 1923. Two-thirds of supply from 8 wells 280 to 300 feet, drilled 1927. Between 1894–1923 all municipal water from "Old Park" supply, which was supplemented until 1927 with 1923 group of wells. Between 1927–33 "Old Park" supply shut down. Between November 1933 and May 1934, 1927 group of wells also shut down. Wells located 2, 6, and 9 miles, respectively, south of Big Spring.	Sample consists of all children in fifth and sixth grades whose history indicated constant residence and continuous use of city water.
Total	2,893	226	85	264	325	322	80	0	637	123	367	283	152	23	0		

[1] None examined.

[2] Rand McNally pocket map of Texas, 1934.

Table 1.—*Summary of mottled enamel findings and history of water supply in certain cities of (1) Panhandle and west Texas and (2) east central Texas*—Continued

2. EAST CENTRAL TEXAS

City and population (census of 1930)	Total number of children examined	Children classified according to mottled enamel diagnosis: (A) Continuous residence with constant use of city water: Normal	(A) Questionable	(A) Very mild	(A) Mild	(A) Moderate	(A) Moderately severe	(A) Severe	(B) Changes in residence and/or water history: Normal	(B) Questionable	(B) Very mild	(B) Mild	(B) Moderate	(B) Moderately severe	(B) Severe	History of water supply	Remarks
Bartlett (1,873)	29	0	0	4	3	18	3	1	(1)	(1)	(1)	(1)	(1)	(1)	(1)	From a 2,005-foot well drilled 1901 and in constant use since. Apparently obtaining water from different strata.	Sample consists of all children in fifth, sixth, and seventh grades with a continuous residence since birth and constant use of city water.
Italy (1,230)	34	0	2	6	11	10	5	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	From 850-foot well drilled 1912 and in constant use since. According to local data water is obtained from second Woodbine stratum.	Sample consists of all children in fourth, fifth, sixth, and seventh grades who comply with "A" classification.
Frost (748)	13	0	1	4	3	5	0	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	From 1,184-foot well drilled 1903 into the Trinity sands. This is the only supply used since that year.	Sample consists of all children in fifth, sixth, and seventh grades who comply with "A" classification
Taylor (7,463)	45	5	3	14	10	8	5	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	From a 3,260-foot well drilled 1913 and a 3,300-foot well drilled 1934. Due to high sulphur content of city water some inhabitants use cistern water for certain domestic purposes.	Sample consists of all children in the sixth grade coming under "A."
Palmer (758)	16	1	2	3	6	2	2	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	Between 1900 and 1928 supply obtained from 1,170-foot well; 1928 to date, entire city supply obtained from 1,172-foot well drilled into Woodbine stratum.	Sample consists of all children in the third, fourth, and fifth grades who comply with "A" classification.
Ferris (1,438)	26	3	2	5	10	5	1	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	Since 1921 entire city water supply obtained from a 1,400-foot artesian well.	Sample consists of all children in the fourth, fifth, and sixth grades who comply with "A" classification. During the examination in Ferris, 5 pupils who had always lived in the nearby community of India, but who attended school in Ferris, were observed. All 5 showed mottled enamel moderate in severity. These 5 are not included in the Ferris totals.

Belton (3,779)	43	6	5	6	17	7	2	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	From 2 wells, 1 drilled 1903, 980 feet in the first Trinity sands, and 1 drilled 1915, 1,180 feet into the second Trinity sands.	Sample consists of all children in the fifth and sixth grades who comply with "A" classification.
Ennis (7,069)	71	8	6	21	23	10	8	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	From 1909-25 supply obtained from two 1,325-foot wells drilled to the first Woodbine sand. August 1925 well installed, obtaining water from the second Woodbine sand between 1,700 and 1,798 feet deep; 1930 the smaller of the first 2 wells was abandoned. Present supply comes from one 1,325-foot well and one 1,798 feet, the latter in the second Woodbine stratum, and furnishing the major portion of the water supply since 1926.	Sample consists of all children in the third, fourth, and fifth grades who comply with "A" classification.
Gatesville (2,601)	17	2	2	6	6	1	0	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	From two 700-foot wells drilled in 1910 and in constant use since that date.	Sample consists of all children in the sixth grade who comply with "A" classification.
Granger (1,703)	12	0	1	5	6	0	0	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	From a 2,531-foot well drilled 1906 or 1907 and in constant use since that year.	Sample consists of all children in the sixth and seventh grades who comply with "A" classification.
Waxahachie (8,042)	30	11	5	11	3	0	0	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	Since 1913 from 3 wells, 2,900 to 3,000 feet, drilled into the Trinity sands. These wells were drilled 1913, 1925, and 1931, respectively.	Sample represents children from the fourth, sixth, and seventh grades of the Central Ward School who comply with "A" classification.
West (1,807)	25	11	6	7	1	0	0	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	From a well, 2,200 feet deep, drilled 1894 into the second Trinity sands and in continuous use since that year.	Sample consists of all children in the fifth and sixth grades who comply with "A" classification.
Hillsboro (7,823)	46	19	13	12	2	0	0	0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	Since 1923 city water supply obtained from 14 wells. There is considerable variation in the depth and strata from which the water is and was obtained. Limited space precludes detailed description of this supply.	Sample consists of all children in the sixth grade who comply with "A" classification.
Total	407	66	48	104	101	66	21	1	(1)	(1)	(1)	(1)	(1)	(1)	(1)		
Grand total (1 plus 2).	3,300	292	133	368	426	388	101	7	637	123	367	283	152	23	0		

[1] None examined.

[2] Rand McNally pocket map of Texas, 1934.

Table 2.—*Summary of mottled enamel findings in certain communities of the Panhandle and west Texas with a common water supply but where an insufficient number of examinations precluded the computation of a mottled enamel index*

City and population (census of 1930)	Total number of children examined	Children classified according to mottled enamel diagnosis: (A) Continuous residence with constant use of city water: Normal	(A) Questionable	(A) Very mild	(A) Mild	(A) Moderate	(A) Moderately severe	(A) Severe	(B) Changes in residence and/or water history: Normal	(B) Questionable	(B) Very mild	(B) Mild	(B) Moderate	(B) Moderately severe	(B) Severe	History of water supply	Remarks
Lorenzo (739)	25	0	0	1	4	2	0	0	2	4	4	4	3	1	0	Municipal water supply obtained from one 280-foot well, drilled in 1926. First stratum cased off.	Sample "A" represents all children in the third and fourth grades who used city water for the past 6 years. Sample "B" represents children who have used continuously water from local or nearby rural windmill wells.
Idalou (538)	33	0	0	1	2	3	2	0	1	1	5	6	12	0	0	From 1 well, drilled in 1925, 136 feet. First stratum cased off and city supply obtained from second stratum.	Sample "A" represents children from the second, third, fourth, and fifth grades. Sample "B" represents children who have used continuously water from nearby rural windmill wells.
White Deer (1,010)	28	6	0	0	0	0	0	0	18	0	3	1	0	0	0	From one 396-foot well, drilled in 1926, cased entire depth and obtaining water from the "bottom" stratum only.	Sample "A" represents all children of the sixth grade coming under that classification. High percentage of children showing normal calcification warrants a detailed epidemiological survey.
Vega (519)	37	0	0	1	3	2	0	0	10	2	8	9	2	0	0	From 2 wells, one 240-foot, drilled in 1921, and one 396-foot, drilled in 1928. The latter supplies practically all the water.	Sixth and seventh grades examined. "B" includes children from immediate rural districts.
Total	123	6	0	3	9	7	2	0	31	7	20	20	17	1	0		

TABLE 3.—*Summary of mottled-enamel findings in certain communities of the Panhandle and west Texas with no common water supply.* (*See two exceptions under "Remarks"*)

COMMUNITIES WHERE WATER FROM INDIVIDUAL WINDMILL WELLS IS USED

City and population (census of 1930)	Total number of children examined	Children classified according to mottled enamel diagnosis							History of water supply and remarks
		Normal	Questionable	Very mild	Mild	Moderate	Moderately severe	Severe	
Southland (400)[1]	21	0	0	0	4	12	5	0	Sample represents all children in fourth and fifth grades who stated they had either lived in Southland or immediate rural school district all their lives and had always used water from windmill wells. Individual windmill wells in this particular area are approximately 100 to 125 feet in depth.
Two Floyd County rural districts.	23	0	2	6	7	7	1	0	Examinations were made in 2 rural schools, one 4 miles south of Lockney, the other 12 miles west and 2 miles south of Floydada; 14 of the children stated they had always used water from individual windmill wells located within the borders of their respective school districts.
Three Potter County rural districts.	98	22	8	16	35	16	1	0	Examinations were made in 3 rural schools, located at Bushland, River Road, and Highland Park, respectively, 10 miles west, 6 miles north, and 10 miles east of Amarillo. Sample contains children with a history of continuous residence in the district and others born elsewhere. Water is obtained from individual windmill wells apparently from the first stratum.
Happy (724)	29	5	6	7	5	5	1	0	Although Happy has a municipal water supply installed in 1923, it was not possible to find more than 3 children in the grades examined who had used the city water for at least the past 5 years, many of the inhabitants continuing to use windmill wells. Most of the sample represents children from the immediate rural districts.
Monroe (50)[1]	17	3	6	6	2	0	0	0	Children in this sample stated they had lived continuously either in Monroe or the immediate rural district and had used water from individual windmill wells.
Abernathy (858)	34	9	12	7	4	1	1	0	There is no municipal water supply in Abernathy and sample represents children who stated they had always lived either in Abernathy or in the school district, and who had always used water from individual windmill wells, which vary from 118 to 130 feet in depth.
Wildorado (105)[1]	30	6	10	3	10	1	0	0	This sample represents children from the third, fourth, fifth, sixth, and seventh grades and contains many with both continuous and variable histories. Individual windmill wells are approximately 150 feet deep.
Farnsworth (25)[1]	20	7	2	4	4	3	0	0	Sample represents children in the fourth, fifth, sixth, and seventh grades and includes children from both Farnsworth and the immediate rural district. Water histories in this group vary. Water is obtained from individual windmill wells.

[1] Rand McNally pocket map of Texas, 1934.

TABLE 3.—*Summary of mottled-enamel findings in certain communities of the Panhandle and west Texas with no common water supply. (See two exceptions under "Remarks")*—Continued

COMMUNITIES WHERE WATER FROM CISTERNS IS USED FOR DOMESTIC PURPOSES

City and population (census of 1930)	Total number of children examined	Children classified according to mottled enamel diagnosis							History of water supply and remarks
		Normal	Questionable	Very mild	Mild	Moderate	Moderately severe	Severe	
Jayton (623)	6	6	0	0	0	0	0	0	The 6 examined represent children who had lived in Jayton all their lives and had used continuously water from cisterns for domestic purposes. Afternoon school dismissal of the pupils prevented examination of any additional number. The city has a common water supply, but it is of a type which obviates its use for domestic purposes, and the inhabitants of this town use cistern water for cooking and drinking.
Gail (100)[1]	17	15	1	1	0	0	0	0	Sample represents children from the fourth, fifth, and sixth grades with a history of continuous residence in Gail or nearby rural districts for the major part of their lives. The 1 case of mottled enamel had lived at O'Donnell, an endemic area, from birth to 2 years of age. Water for domestic purposes is obtained from cisterns and occasionally surface sources.
Total	295	73	47	50	71	45	9	0	

DISCUSSION

This survey presents definite evidence that the Panhandle-west Texas region constitutes the largest mottled-enamel area in the United States. There is no doubt that a detailed survey would disclose many additional smaller communities and rural districts where mottled enamel is endemic. Since this territory is generally affected through all gradations from a slight to a marked degree, the influence of the causative factor of mottled enamel is operative over a vast area, with the result that many thousands of the inhabitants are affected.

The area known as the "Llano Estacado" is apparently the most severely affected. From observations made during this survey, the region of the greatest severity centers in and around the city of Lubbock and extends in an easterly direction toward Spur and Post, northward toward Plainview and Amarillo, and southward toward Lamesa. The fact that such large cities as Amarillo, Lubbock, and Plainview are located in the region of the greatest severity makes this a serious problem of keen public-health interest. Although definite manifestations of endemic mottled enamel are readily demonstrable in communities located north of the Canadian River and south of the eastward prolongation of the southern boundary of the State of New Mexico (Edwards Plateau), the type of mottled enamel being developed in these two regions is markedly less severe, the community index generally being slight.

Examination of numerous children, who spent the first 5 or 6 years of their lives in eastern New Mexico, indicates definitely that mottled enamel comparable to that found in west Texas is likewise being developed in eastern New Mexico.

The east central Texas area should be further studied and the boundaries of endemicity determined. Endemic mottled enamel has now been definitely demonstrated in numerous localities between Austin and Dallas. In certain communities, such as Bartlett, Italy, and Frost, a type of mottled enamel is being produced that is comparable in severity with some of the more seriously affected cities and towns of west Texas.

SUMMARY

(A) THE PANHANDLE AND WEST TEXAS

1. The Panhandle-west Texas region constitutes the largest mottled-enamel area in the United States. As a result of the unusual population influx between 1920 and 1930, the number of children affected has correspondingly increased.

2. Of 53 communities surveyed in 37 counties, only 6 could be classified as "negative" or "border line."

3. The fact that the municipal water supplies of such large cities as Amarillo, Lubbock, and Plainview contain the causative factor of

mottled enamel in sufficient concentration to produce this hypoplasia in a high percentage of their children has developed an acute and urgent public health problem.

(B) EAST CENTRAL TEXAS

4. An endemic area of unknown size is reported in east central Texas between Austin and Dallas.

5. Of 13 communities surveyed, only 2 were classified as "border line" and none was classified as "negative."

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(8) Fifteenth Census of the United States; 1930, Vol. 1, Population, Number and Distribution of Inhabitants. Bureau of the Census, Washington, 1931.

OBSERVATIONS ON THE EPIDEMIOLOGY OF LEPROSY IN HAWAII

A study[1] of some of the epidemiological features of leprosy was undertaken in Hawaii because statistics of the certification of leprous persons and of the general population have been recorded for many years, and the modern development of this insularly isolated community seemed to offer a unique opportunity for such researches. Data have been collected and analyzed and investigations have been made in an effort to contribute to the knowledge of the following aspects of the subject: The trend of the local prevalence or incidence; probable age of infection; ratio of the affection in the sexes; degree of communicability; susceptibility of races; relation of contact with infection to the development of the disease; and the correlation of the economic and environmental status of the affected people with the prevalence of the disease among them.

[1] Leprosy: Observations on its epidemiology in Hawaii. By N. E. Wayson and Theodore R. Rhea. Public Health Bulletin No. 212.

The analyses and deductions are based on the records of admissions to segregation during the period of the last 40 years, upon researches into the occurrence of the disease in 400 to 500 family groups, and upon detailed field investigations of the immediate environmental circumstances of approximately 100 of these families.

The average number and rate of annual admissions from both the general and specific populations have declined rather steadily and continuously. In the decade 1890 to 1900 the annual admission rate per thousand among the native Hawaiians was approximately 3.5, while in the quinquennium 1926 to 1930 it was less than 1 per thousand. This specific group lends itself to more accurate study because its total number has not been directly affected by immigration or emigration during this period. The decrease noted has been proportionately greater in the younger age groups, in which formerly the higher admission rates had prevailed; and it is believed that the declining rate of all admissions reflects a diminished incidence of the disease. This suggested decline in the incidence seems to be consequent to, or at least coincidental with, general biological and environmental influences which are put in evidence by falling death rates from other causes rather than as a result of specific control measures. During the past 40 years and just prior to the beginning of that period, there were importations of relatively large numbers of people from localities in which leprosy has been endemic for a long time. These immigrations have directly influenced the racial composition of the population and have probably brought about other biological changes indirectly. It is found that the proportionate distribution of the cases of leprosy among the different races has changed, so that in later years approximately 40 percent of the admissions have come from among the people more recently imported, whereas formerly 90 percent of admissions were of the native people.

The incidence of the disease is somewhat higher in certain racial groups, but no evidence is found of a definite racial susceptibility and the disproportions may apparently be attributed with reason to environmental factors which obtain in the different groups.

Inquiries into the frequency of leprosy within family groups in Hawaii reveal the fact that it is readily communicable and that the percentage of those affected in such groups is often greater than that which was found to occur in clinical pulmonary tuberculosis among certain families studied in the United States. Thus, in a total of 996 members of 122 families, in each of which there was more than 1 child, 302 cases of leprosy were admitted during the past 20 years. This represents more than 30 percent of the total family membership. From 14 of these families in which there were 4 or more children 43 percent of the 137 family members were admitted.

Children who are exposed to leprosy when they are younger than 15 years of age are found to be affected more frequently than those individuals who are older when exposed; and the readiness with which they or others develop the disease seems to be influenced by their age at the time of exposure, the period of time through which the exposure prevails, and the intimacy of the exposure. These deductions are supported by the facts that, among 71 families from which a parent or child was admitted with leprosy during the past 15 years, there were 72 children of the age of 0–4 years remaining after the original case was admitted, and 44.4 percent of those children remaining were subsequently admitted; of 64 children of the age of 5–9 years remaining, 32.8 percent were admitted subsequently; of 50 children of the age of 10–14 years remaining, 22 percent were subsequently admitted; and of 27 children of the age of 15–19 years remaining, 11.1 percent were subsequently admitted. After reviewing the statistics of all admissions and the clinical experiences in Hawaii, it appears probable that 40 percent or more of those who develop the disease were infected before reaching 15 years of age.

The rates of admission point to a ratio of infection of about 1 female to 1.5 males.

The incidence of leprosy is higher in the rural sections than in the urban districts; and in the former locations a lower average economic, sanitary, and dietary status prevails among the affected families and a greater frequency of contact with cases occurs within them.

The average economic status of approximately 100 families in which leprosy has occurred is found to be low when measured by local relief standards, and their average dietary is chiefly that of carbohydrates, is low in milk and meat proteins and butter fat, and seemingly low in calcium and vitamins B and C, when comparisons are made with standards regarded as adequate in Hawaii and in continental United States. No direct correlation, however, between the rate of leprosy and these conditions has been determined among this group of families.

DEATHS DURING WEEK ENDED MAR. 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Mar. 9, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	9,080	9,451
Deaths per 1,000 population, annual basis	12.7	13.2
Deaths under 1 year of age	655	687
Deaths under 1 year of age per 1,000 estimated live births	60	64
Deaths per 1,000 population, annual basis, first 10 weeks of year	12.9	12.7
Data from industrial insurance companies:		
Policies in force	67,519,370	67,571,251
Number of death claims	15,131	15,707
Death claims per 1,000 policies in force, annual rate	11.7	12.1
Death claims per 1,000 policies, first 10 weeks of year, annual rate	10.9	11.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Mar. 16, 1935, and Mar. 17, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 16, 1935, and Mar. 17, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 16, 1935	Week ended Mar 17, 1934	Week ended Mar 16, 1935	Week ended Mar 17, 1934	Week ended Mar. 16, 1935	Week ended Mar. 17, 1934	Week ended Mar. 16, 1935	Week ended Mar. 17, 1934
New England States:								
Maine	1		15	1		30	0	0
New Hampshire					14	223	0	0
Vermont		1			1	54	0	0
Massachusetts	4	13			338	2,003	2	0
Rhode Island	2				64	5	0	0
Connecticut		6	9	15	878	38	0	1
Middle Atlantic States:								
New York	25	35	[1] 12	[1] 29	2,627	1,223	17	3
New Jersey	20	13	25	13	1,106	514	2	3
Pennsylvania	51	59			5,234	3,697	3	2
East North Central States:								
Ohio	60	38	149	144	1,148	1,384	13	2
Indiana	11	22	20	57	453	435	0	1
Illinois	61	28	70	37	3,202	1,419	25	4
Michigan	15	10	5	5	3,447	86	1	1
Wisconsin	6	7	77	55	2,068	1,307	5	2
West North Central States:								
Minnesota	1	5		2	1,599	224	3	0
Iowa	10	6	46	7	1,305	160	0	1
Missouri	29	48	172	158	892	1,010	18	1
North Dakota	2	10	3	29	170	173	0	1
South Dakota	8	2		6	56	478	0	0
Nebraska	5	3		9	660	257	4	0
Kansas	7	15	14	1	1,379	255	3	0
South Atlantic States:								
Delaware		3			8	181	0	0
Maryland [3]	4	10	34	25	59	776	5	0
District of Columbia	6	8	2		49	606	9	0
Virginia	26	21			1,081	1,697	6	7
West Virginia	19	14	254	55	506	45	8	1
North Carolina	15	16	55	61	699	3,369	2	1
South Carolina	2	17	834	757	46	572	1	0
Georgia [3]	11	11	225			1,490	0	1
Florida	4	2	29	7	100	235	1	[illegible]

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 16, 1935, and Mar. 17, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 16, 1935	Week ended Mar. 17, 1934	Week ended Mar. 16, 1935	Week ended Mar. 17, 1934	Week ended Mar. 16, 1935	Week ended Mar. 17, 1934	Week ended Mar. 16, 1935	Week ended Mar. 17, 1934
East South Central States:								
Kentucky	10	25	78	69	605	491	2	1
Tennessee	15	12	223	161	115	1,425	5	5
Alabama [3]	10	9	303	125	373	832	2	1
Mississippi [2]	1	8					1	0
West South Central States:								
Arkansas	3	3	106	35	37	374	0	0
Louisiana [3]	26	26	18	8	241	203	0	1
Oklahoma [4]	4	10	198	78	278	1,025	5	1
Texas [3]	46	113	737	652	155	3,106	4	6
Mountain States:								
Montana	8	1	145		273	18	1	0
Idaho		5			70	74	0	0
Wyoming	1				100	54	0	0
Colorado		5			803	214	0	0
New Mexico	7	5	26	2	35	124	3	0
Arizona	1		53	31	38	55	2	0
Utah [3]					19	608	0	0
Pacific States:								
Washington	4	2	1		221	155	0	0
Oregon		3	83	87	158	70	2	0
California	38	26	215	48	885	1,363	4	3
Total	579	676	3,744	2,764	33,695	34,217	159	49

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 16, 1935	Week ended Mar. 17, 1934	Week ended Mar. 16, 1935	Week ended Mar. 17, 1934	Week ended Mar. 16, 1935	Week ended Mar. 17, 1934	Week ended Mar. 16, 1935	Week ended Mar. 17, 1934
New England States:								
Maine	0	0	15	25	0	0	2	1
New Hampshire	0	0	20	12	0	0	0	0
Vermont	0	0	20	18	0	0	0	0
Massachusetts	0	0	277	275	0	0	1	1
Rhode Island	0	0	22	14	0	0	0	0
Connecticut	0	0	95	92	0	0	0	0
Middle Atlantic States:								
New York	0	1	1,102	902	0	0	7	10
New Jersey	0	0	190	208	0	0	5	5
Pennsylvania	0	0	643	834	0	0	5	9
East North Central States:								
Ohio	0	1	1,034	978	0	0	1	2
Indiana	0	1	212	229	0	2	0	0
Illinois	1	1	1,227	663	1	3	12	0
Michigan	0	0	427	876	0	11	0	5
Wisconsin	2	1	523	277	26	35	1	0
West North Central States:								
Minnesota	1	0	187	69	13	3	0	0
Iowa	0	0	83	86	0	11	1	0
Missouri	1	0	87	125	4	15	1	1
North Dakota	0	2	105	41	0	4	1	0
South Dakota	0	0	10	13	0	4	0	0
Nebraska	1	0	57	28	41	4	1	5
Kansas	0	0	84	111	8	3	0	1
South Atlantic States:								
Delaware	0	0	27	19	0	0	0	0
Maryland [3]	0	0	95	79	0	0	0	3
District of Columbia	1	0	100	14	0	0	0	0
Virginia	0	1	85	45	0	0	3	2
West Virginia	0	0	126	58	0	0	3	1
North Carolina	1	1	33	42	0	0	0	3
South Carolina	0	0	4	5	0	0	0	3
Georgia [3]	0	1	10	6	2	0	0	5
Florida	0	1	9	5	0	0	6	4

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 16, 1935, and Mar. 17, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 16, 1935	Week ended Mar. 17, 1934	Week ended Mar. 16, 1935	Week ended Mar. 17, 1934	Week ended Mar. 16, 1935	Week ended Mar. 17, 1934	Week ended Mar. 16, 1935	Week ended Mar. 17, 1934
East South Central States:								
Kentucky	1	1	24	108	0	0	3	3
Tennessee	0	0	33	29	0	2	2	4
Alabama [3]	0	1	13	12	2	0	1	3
Mississippi [2]	0	0	6	25	1	0	2	8
West South Central States:								
Arkansas	0	0	6	8	1	2	0	1
Louisiana [3]	1	0	30	24	1	5	8	10
Oklahoma [4]	0	0	18	10	0	3	2	5
Texas [3]	1	0	84	133	7	35	12	10
Mountain States:								
Montana	0	0	11	18	0	0	0	2
Idaho	0	0	5	2	0	3	0	0
Wyoming	0	0	8	7	7	0	0	0
Colorado	0	0	307	26	6	15	1	0
New Mexico	0	0	7	20	4	2	2	3
Arizona	0	0	24	20	1	0	0	0
Utah [2]	0	0	94	6	7	0	0	0
Pacific States:								
Washington	0	1	52	60	25	11	2	1
Oregon	1	0	66	31	4	10	3	2
California	0	6	260	207	8	17	4	5
Total	21	20	7,966	6,893	169	200	92	118

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Mar. 16, 1935, 10 cases, as follows: Georgia, 1; Alabama, 2; Louisiana, 1; Texas, 6.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
February 1935										
Connecticut	2	16	103		2,633		0	221	0	3
Delaware		6	8		6		0	74	1	0
District of Columbia	27	67	18		30		2	150	0	5
Indiana	12	152	407		2,107		2	1,069	14	5
Iowa	10	33	435		5,640		3	372	12	6
Minnesota	8	40	107		8,924		1	552	17	1
Nebraska	21	35	37		1,827		3	154	165	0
New Jersey	6	65	98		2,113		1	581	0	3
New Mexico	4	28	352		81		1	79	3	12
North Carolina	13	75	883		3,058	5	1	135	0	5
South Carolina	6	95	3,575	191	138	45	1	24	0	6
Tennessee	39	64	1,654	22	148	4	2	151	1	8

Summary of monthly reports from States—Continued

February 1935

	Cases
Actinomycosis:	
South Carolina	1
Conjunctivitis:	
Connecticut	1
New Mexico	2
Chicken pox:	
Connecticut	622
Delaware	45
District of Columbia	240
Indiana	526
Iowa	196
Minnesota	326
Nebraska	222
New Jersey	1,753
New Mexico	114
North Carolina	417
South Carolina	51
Tennessee	153
Dengue:	
South Carolina	4
Diarrhea:	
South Carolina	138
Dysentery:	
Connecticut (amoebic)	1
Connecticut (bacillary)	4
Minnesota (amoebic)	8
New Jersey (amoebic)	2
New Mexico (unspecified)	9
New Mexico (bacillary)	8
Tennessee:	5
Epidemic encephalitis:	
Indiana	1
Iowa	1
Minnesota	2
New Jersey	9
South Carolina	3
Food poisoning:	
New Mexico	1
German measles:	
Connecticut	124
Delaware	2
Iowa	87

February 1935—Continued

	Cases
German measles—Con.	
New Jersey	504
New Mexico	293
North Carolina	25
Tennessee	4
Hookworm disease:	
South Carolina	31
Impetigo contagiosa:	
Iowa	2
Tennessee	2
Mumps:	
Connecticut	220
Delaware	28
Indiana	69
Iowa	776
Nebraska	225
New Jersey	417
New Mexico	58
South Carolina	287
Tennessee	84
Ophthalmia neonatorum:	
Minnesota	1
New Jersey	6
South Carolina	9
Tennessee	5
Paratyphoid fever:	
Connecticut	1
New Jersey	2
Tennessee	1
Puerperal septicemia:	
New Mexico	6
Tennessee	2
Rabies in animals:	
Indiana	38
New Jersey	4
South Carolina	62
Rabies in man:	
Indiana	1
Scabies:	
Tennessee	16

February 1935—Continued

	Cases
Septic sore throat:	
Connecticut	15
Iowa	4
Minnesota	3
Nebraska	7
New Mexico	3
North Carolina	8
Tennessee	13
Trachoma:	
New Mexico	1
North Carolina	1
Trichinosis:	
Iowa	1
Minnesota	1
Tularaemia:	
North Carolina	3
Tennessee	4
Typhus fever:	
North Carolina	2
South Carolina	4
Undulant fever:	
Connecticut	3
Delaware	4
Iowa	5
Minnesota	5
New Jersey	1
North Carolina	2
South Carolina	2
Tennessee	1
Vincent's infection:	
Tennessee	5
Whooping cough:	
Connecticut	279
Delaware	22
District of Columbia	10
Indiana	150
Iowa	47
Minnesota	162
Nebraska	23
New Jersey	1,440
New Mexico	87
North Carolina	1,246
South Carolina	139
Tennessee	228

CASES OF VENEREAL DISEASES REPORTED FOR JANUARY 1935

This statement is published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State health officers. They are preliminary and are, therefore, subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama [1]				
Arizona	42	.93	133	2.94
Arkansas	442	2.36	128	.68
California	1,640	2.71	1,388	2.29
Colorado [1]				
Connecticut	234	1.42	154	.94
Delaware	107	8.17	32	1.33
District of Columbia	151	3.05	122	2.46
Florida	574	3.69	64	.41
Georgia	365	1.25	282	.97
Idaho	0		0	
Illinois	1,305	1.67	1,291	1.65
Indiana	204	.62	212	.64
Iowa	148	.60	172	.69
Kansas	155	.82	74	.39
Kentucky	199	.75	293	1.11
Louisiana	186	.86	106	.49
Maine	67	.84	49	.61
Maryland	811	4.88	259	1.56
Massachusetts	410	.95	468	1.09

See footnotes at end of table.

Cases of venereal diseases reported for January 1935—Continued

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Michigan	546	1.08	547	1.08
Minnesota	303	1.17	244	.94
Mississippi	1,070	5.23	1,703	8.32
Missouri	704	1.92	460	1.25
Montana	28	.52	21	.39
Nebraska	47	.34	87	.63
Nevada [1]				
New Hampshire [2]				
New Jersey	510	1.22	246	.59
New Mexico	74	1.71	36	.83
New York	5,493	4.24	1,624	1.25
North Carolina	931	2.84	296	.90
North Dakota	20	.29	56	.82
Ohio	777	1.14	213	.31
Oklahoma	162	.78	121	.58
Oregon	71	.72	80	.81
Pennsylvania	321	.33	283	.29
Rhode Island	98	1.40	112	1.60
South Carolina	315	1.80	414	2.37
South Dakota	5	.07	38	.54
Tennessee	1,010	3.79	560	2.10
Texas	184	.31	46	.08
Utah [1]				
Vermont	19	.53	20	.80
Virginia [3]	303	1.24	236	.97
Washington	220	1.38	216	1.35
West Virginia [2]				
Wisconsin [4]	38	.13	111	.37
Wyoming [1]				
Total	20,379	1.72	13,006	1.10

[1] Not reporting.
[2] Has been reporting regularly but no report received for current month.
[3] Incomplete.
[4] Only cases of syphilis in the infectious stages are reported.

NOTE.—Surveys in which all medical sources have been contacted in representative communities throughout the United States have revealed that the monthly rate per 10,000 population is 6.6 for syphilis and 10.2 for gonorrhea.

WEEKLY REPORTS FROM CITIES

City reports for week ended Mar. 9, 1935

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for refer-

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	1	0	1	4	4	0	0	0	7	31
New Hampshire:											
Concord	0		0	0	1	2	0	0	0	0	16
Nashua	0		0	0	0	0	0	0	0	0	0
Vermont:											
Barre	0		0	0	0	0	0	0	0	0	3
Burlington	0		0	29	0	9	0	0	0	0	9
Massachusetts:											
Boston	4		0	25	27	44	0	0	0	25	239
Fall River	0		0	70	3	1	0	1	0	8	32
Springfield	0		0	159	1	6	0	1	0	24	31
Worcester	0		0	1	10	13	0	2	0	13	56
Rhode Island:											
Pawtucket	0		0	0	0	0	0	0	0	0	19
Providence	0		1	58	7	13	0	1	0	8	55
Connecticut:											
Bridgeport	2		2	1	1	16	0	1	0	0	38
Hartford	0		0	90	0	6	0	1	0	10	
H aven	0		1	222	6	0	0	2	0	0	47

City reports for week ended Mar. 9, 1935—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
New York:											
Buffalo	0	------	1	267	26	29	0	7	0	24	166
New York	18	20	8	702	161	630	0	122	3	247	1,632
Rochester	0	------	0	275	5	18	0	2	0	22	73
Syracuse	0	------	1	124	6	6	0	1	1	32	59
New Jersey:											
Camden	2	5	0	0	4	4	0	1	0	5	47
Newark	0	------	1	241	9	23	0	5	0	76	111
Trenton	0	------	0	28	5	9	0	1	0	3	39
Pennsylvania:											
Philadelphia	4	7	6	10	51	111	0	29	0	91	531
Pittsburgh	1	9	1	737	47	37	0	3	0	29	179
Reading	0	------	0	15	1	5	0	1	0	2	25
Scranton	0	------	------	377	------	2	0	------	0	6	------
Ohio:											
Cincinnati	7	------	4	3	21	34	0	9	0	2	151
Cleveland	8	56	0	247	19	40	0	14	0	58	216
Columbus	12	1	1	117	7	39	0	4	0	1	88
Toledo	0	------	0	49	8	13	0	3	0	4	73
Indiana:											
Fort Wayne	1	------	0	22	2	2	0	1	0	0	29
Indianapolis	1	------	0	38	21	37	0	4	0	0	------
South Bend	0	1	1	10	2	5	0	0	0	0	23
Terre Haute	0	------	0	0	0	0	0	0	0	0	23
Illinois:											
Chicago	3	9	8	1,198	65	707	0	39	0	81	502
Springfield	0	------	1	10	1	11	0	0	0	1	25
Michigan:											
Detroit	7	5	2	800	34	180	0	6	0	99	202
Flint	3	------	0	574	10	11	0	0	0	4	29
Grand Rapids	0	------	0	78	2	10	0	1	0	9	34
Wisconsin:											
Kenosha	0	1	1	323	1	29	0	0	0	8	4
Milwaukee	0	1	1	571	12	234	0	3	0	30	127
Racine	0	1	1	36	0	4	0	0	0	6	10
Superior	0	------	0	298	0	2	0	0	0	1	3
Minnesota:											
Duluth	0	------	0	0	3	3	0	0	0	0	26
Minneapolis	2	------	0	1,192	6	69	0	0	0	13	94
St. Paul	1	1	1	12	9	37	0	0	0	4	67
Iowa:											
Davenport	0	------	------	1	------	1	0	------	0	0	------
Des Moines	4	------	------	66	------	24	0	------	0	0	48
Sioux City	0	------	------	11	------	1	0	------	0	3	------
Waterloo	1	------	------	1	------	5	0	------	0	2	------
Missouri:											
Kansas City	3	2	0	194	14	11	0	4	0	4	96
St. Joseph	1	------	0	7	4	2	0	1	0	1	12
St. Louis	12	------	0	11	8	20	0	5	1	5	184
North Dakota:											
Fargo	0	------	0	------	3	27	0	1	0	4	13
Grand Forks	0	------	------	0	------	1	0	------	0	0	------
South Dakota:											
Aberdeen	0	------	------	9	------	0	0	------	0	4	------
Sioux Falls	0	------	------	0	------	2	0	------	0	0	5
Nebraska:											
Omaha	0	------	2	23	8	9	4	2	0	0	62
Kansas:											
Topeka	------	------	------	------	------	------	------	------	------	------	------
Wichita	0	------	0	337	4	2	0	2	0	2	36
Delaware:											
Wilmington	0	------	0	2	3	13	0	0	0	2	23
Maryland:											
Baltimore	3	16	2	9	35	54	0	16	1	17	241
Cumberland	0	1	1	9	1	2	0	1	0	0	19
Frederick	0	------	0	0	1	2	0	0	0	0	7
District of Columbia:											
Washington	13	3	0	32	26	65	0	16	0	4	175
Virginia:											
Lynchburg	0	------	0	216	1	5	0	0	0	8	11
Norfolk	1	2	0	33	8	3	0	2	0	16	34
Richmond	1	------	4	113	11	3	0	3	1	0	78
Roanoke	0	------	1	20	3	1	0	0	0	3	27
West Virginia:											
Charleston	2	------	0	29	1	1	0	1	0	0	10
Huntington	1	------	------	35	------	3	0	------	0	7	------
Wheeling	0	------	0	97	2	23	0	1	0	8	21

City reports for week ended Mar. 9, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
North Carolina:											
Raleigh	0	------	0	1	4	0	0	1	0	0	18
Wilmington	0	------	0	0	5	1	0	0	0	8	18
Winston-Salem	0	2	0	16	1	1	0	0	0	26	11
South Carolina:											
Charleston	0	11	0	7	5	3	0	3	1	0	29
Columbia	0	------	0	0	3	0	0	0	0	0	48
Greenville	0	------	0	0	4	1	0	0	0	0	9
Georgia:											
Atlanta	5	28	3	1	8	4	0	8	0	1	90
Brunswick	0	------	0	0	0	0	0	0	0	0	6
Savannah	0	18	1	1	0	1	0	1	0	1	36
Florida:											
Miami	2	4	0	1	3	1	0	1	0	8	32
Tampa	2	3	3	2	2	1	0	2	1	0	26
Kentucky:											
Ashland	0	4	--------	2	-------	1	0	-------	0	2	--------
Lexington	2	------	0	25	2	0	0	0	0	0	19
Louisville	3	3	0	406	9	29	0	6	0	10	59
Tennessee:											
Memphis	4	------	4	2	20	6	0	5	0	7	89
Nashville	0	------	2	2	10	3	0	1	0	8	58
Alabama:											
Birmingham	1	17	5	11	3	4	0	3	0	0	73
Mobile	1	------	4	0	3	0	0	1	0	0	25
Montgomery	0	------	--------	24	-------	0	0	-------	0	2	--------
Arkansas:											
Fort Smith	-------	------	--------	-------	-------	-------	-------	-------	-------	-------	--------
Little Rock	1	------	0	19	1	0	0	1	0	0	3
Louisiana:											
New Orleans	22	10	7	7	26	9	0	10	0	0	162
Shreveport	0	------	0	12	10	2	1	2	0	0	47
Texas:											
Dallas	5	2	2	0	10	0	0	4	0	1	74
Fort Worth	0	------	2	-------	9	6	0	0	0	0	54
Galveston	0	------	0	0	1	2	0	0	0	0	19
Houston	3	------	2	2	9	2	3	6	1	0	93
San Antonio	4	------	8	1	11	1	0	5	0	0	69
Montana:											
Billings	4	------	0	0	0	3	0	0	0	0	12
Great Falls	0	------	0	-------	0	0	0	0	0	2	3
Helena	0	------	0	76	1	1	0	0	0	0	3
Missoula	0	------	0	-------	1	0	0	1	0	1	11
Idaho:											
Boise	0	------	0	2	1	0	0	0	0	0	4
Colorado:											
Denver	5	39	0	332	7	260	1	6	0	4	74
Pueblo	0	------	0	114	1	2	0	1	0	9	7
New Mexico:											
Albuquerque	0	------	1	5	2	2	0	1	0	12	15
Utah:											
Salt Lake City	0	------	1	16	2	82	0	1	0	43	35
Nevada:											
Reno	0	------	0	0	1	2	0	0	0	0	4
Washington:											
Seattle	0	------	--------	50	-------	8	4	-------	0	2	--------
Spokane	0	------	0	113	5	3	0	1	0	0	49
Tacoma	0	------	0	8	4	3	11	0	0	0	24
Oregon:											
Portland	0	------	0	58	5	11	0	2	0	1	98
California:											
Los Angeles	17	80	3	27	17	75	1	17	0	9	347
Sacramento	4	------	0	26	3	7	0	2	1	0	28
San Francisco	0	2	0	13	7	29	0	9	0	10	166

City reports for week ended Mar. 9, 1935—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				District of Columbia:			
Boston	1	1	0	Washington	11	6	0
Connecticut:				Virginia:			
New Haven	1	0	0	Lynchburg	1	0	0
New York:				Georgia:			
New York	13	3	1	Atlanta	1	0	0
Pennsylvania:				Kentucky:			
Philadelphia	1	2	0	Louisville	2	0	0
Pittsburgh	3	2	0	Tennessee:			
Ohio:				Memphis	1	0	0
Cincinnati	7	1	1	Alabama:			
Cleveland	4	2	0	Birmingham	2	0	0
Toledo	0	1	0	Louisiana:			
ndiana:				New Orleans	3	0	0
Indianapolis	1	0	0	Texas:			
Illinois:				Dallas	0	1	0
Chicago	14	10	0	Fort Worth	1	0	0
Wisconsin:				Colorado:			
Milwaukee	0	1	0	Denver	0	0	1
Minnesota:				New Mexico:			
Minneapolis	1	1	0	Albuquerque	1	1	0
Iowa:				Utah:			
Des Moines	2	0	0	Salt Lake City	1	1	0
Missouri:				Washington:			
Kansas City	1	0	0	Seattle	0		1
St. Louis	4	2	0	Spokane	0	1	0
Nebraska:				California:			
Omaha	0	2	0	Los Angeles	0	0	7
Maryland:							
Baltimore	1	2	0				

Dengue.—Miami, 1 case.
Epidemic encephalitis.—Cases: New York, 3; Pittsburgh, 1; Cleveland, 2.
Pellagra.—Cases: Savannah, 3; Birmingham, 1; New Orleans, 1; Los Angeles, 1; San Francisco, 1.

FOREIGN AND INSULAR

MEXICO

Smallpox.—A report dated March 15, 1935, states that smallpox has been reported in Mexico, as follows: During the week ended January 26, 1935, 1 case was reported in the city of Juarez. In the city of Chihuahua, Chihuahua State, 3 cases of smallpox were reported during January 1935, 6 cases during February, and 11 cases during March. Deaths from smallpox were reported during January 1935, as follows· 1 at Saucillo, 2 at Guadalupe, 1 at Carichic, 2 at Batopilas, 1 at Cienega de Ortiz, and 3 at Neoqui. During the month of February 1935 a total of 17 deaths was reported as follows: 3 at Cienega de Ortiz, 5 at Neoqui, and 9 at Villadama. Intense vaccination is being carried on, the entire population of Oja Caliente, Chihuahua State, being vaccinated.

116610°—35——3

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following table must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		July 29–Aug. 25, 1934	Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Week ended— December 1934					January 1935				February 1935			
						1	8	15	22	29	5	12	19	26	2	9	16	23
Ceylon:																		
Colombo	C																16	6
	D																12	5
Peliyagoda	C																10	
	D																6	
China: Shanghai	C	1																
India	C	58,347	53,090	19,100	16,176	5,069	5,640	2,974	1,962	1,191	4,425	3,772	4,043					
	D	29,499	26,643	9,524	8,559	2,547	2,829	1,497	1,009	570	2,284	2,005	2,090					
Assam	C			43	327	105	243	297										
	D				183	64	83	127										
Bassein	C					1	1	4	5	4	2	2	2	2	1	1	2	2
	D							2	4	3	2	3	1	3		1	2	1
Bombay Presidency	C	11,364	5,974	1,973	872	205	181	117	56	33	26	28	21	15	19			
	D	4,125	2,355	925	383	70	88	50	31	17	16	12	13	4	8			
Bombay	C	1	2															
Calcutta	C	182	183	110	78	25	10	46	36	49	53	30	30	61	96	151		179
Chittagong	C	2	1	1	1	1	8	3	1	4							2	2
Madras Presidency	C	6,883	3,047	1,098	1,901	996		2,452		1,709	1,394	1,553	2,109					
	D	3,184	1,695	526	895	469		1,201		799	705	911	1,114					
Madras	C	145	60	7	59	3	3	8	5	8	2	5	9	9	3	2	1	
	D	55	29	5	32	1		3	4	4	1	5	4	7	1	1	1	
Porto Novo	C								P									
Moulmein	C													1	7		11	8
Negapatam	C				1							12				1		1
Punjab	C		35															
	D		25															
Rangoon	C		1			1						2	1	18	10	7	10	7
Tuticorin	C												1					
Vizagapatam	C	4	6															

India (French):																		
Chandernagor	D		1	1														
Karikal	C	16	47	5	2				4	7	11	15	2	27	15	2		
Pondichery	C	106	59		10		2	3	3	21	4	6	19	21	4	4		
Indo-China (see also table below):																		
Kandal	C											2						
Pnom-Penh	C	2						1	1							1		
Siam.[1]																		
On vessels:																		
S. S. *Erinpura* at Port Swettenham	C	1																
S. S. *Aronda* at Rangoon from Calcutta	C		1															
S. S. *Ellenga* at Rangoon from Calcutta	C										1							
S. S. *Tilawa* at Cocanada	C															[2] 1		

[1] Cholera has been reported in Siam as follows: For the week ended Mar. 2, 1935, 13 cases with 2 deaths at Roy Ech, Nagara Rajsima; for the week ended Mar. 9, 1935, 1 case at Bangkok, Siam.
[2] Suspected.

Place		September 1934			October 1934			November 1934			December 1934			January 1935	
		1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20
Indo-China (French) (see also table above):															
Cambodia [3]	C				1			3							
	D				1			3							
Cochin-China [3]	C			1				1	2						1
	D			1				1	2						1

[3] Reports incomplete.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE[1]

[C indicates cases; D, deaths; P, present]

Place		July 29-Aug. 25, 1934	Aug. 26-Sept. 29, 1934	Sept. 30-Oct. 27, 1934	Oct. 28-Nov. 24, 1934	Week ended— December 1934: 1	8	15	22	29	January 1935: 5	12	19	26	February 1935: 2	9	16	23
Argentina (see also table below): Santiago de Estero Province—Frias	C						1											
Azores. (See table below.)																		
Belgian Congo	C				14						1	2	1					
Brazil:																		
Alagoas State	C							5										
	D							2										
Ceara State	C						2											
British East Africa (see also table below):																		
Kenya	C	5	13	1	5	1	3				17							
Uganda	C	101	70	89	79	33	13	16	38	22	17	14	26	22	9	16		
	D	101	69	85	75	34	13	16	33	18	17	12	25	22	9	16		
Canary Islands: Las Palmas	C												1					
Ceylon: Colombo	C		1		2					1					1	1		
	D				2	1										2		
Plague-infected rats			1		3													
China (see also table below):																		
Amoy.[2]																		
Kangping.[3]																		
Manchuria[4]	D	8																
Mansantun[5]	D									4								
Dutch East Indies:																		
Cheribon	C																	[6] 1
Java—Batavia	C			5														
	D			5														
West Java	C	1,721	2,201	1,684	1,658	478	502	517	631									
	D	1,720	2,201	1,684	1,658	478	502	517	626									
Ecuador:																		
Celica	C																[7] 16	
Pungala and Tixan (near)	C																[7] 14	
Egypt:																		
Alexandria—Plague-infected rats		P	P	P	P		P		P		P		P		P			
Asyut	C				2													
Beni-Suef	C				1													
Girga	C													1	1			
Hawaii Territory:																		
Hawaii Island—Hamakua district—																		
Kalopa—Plague-infected rats				1	3													
Paauhau	C				1													
	D				1													

Plague-infected rats				1														
Pohakea—Plague-infected rats				1														
Maui Island—Makawao district—Kahului[8] (9 miles from)—Plague-infected rats				2														
Paia—Plague-infected rats				1														
India	C	3,032	6,640	5,642	4,167	1,059	964	817	865	844	2,159	1,212	1,071					
	D	1,777	3,981	3,114	2,424	597	587	521	532	638	1,300	649	721					
Bassein	C	5	1	2	3					1						1		
Plague-infected rats		3	3	1														
Bombay Presidency	C	1,464	2,929	2,759	2,093	372	300	220	225	214	232	300	251	291	360			
	D	842	1,760	1,626	1,109	230	176	134	146	137	138	165	148	152	179			
Bombay	C		1										1					
Plague-infected rats			2	1														
Madras Presidency	C	333	553	309	230	119		63		76	60	58	79					
	D	165	296	183	92	63		24		40	20	31	35					
Moulmein	C	1																
	D	1																
Punjab	C			29	53	10	17	8	11	13	9	5	11	7	14	18	85	30
	D			17	35	8	13	7	6	11	5	2	5	7	9	10	25	17
Rangoon	C	1	3								1					[6]1		
Plague-infected rats		1				1												
Indo-China (see also table below):																		
Bentre	C	1																
Kandal	C											1						
Pnom-Penh	C	1	3	2	1			1	1									
Saigon and Cholon	C	1	1		2													
Madagascar. (See table below.)																		
Morocco: Tangier	C				7													
Peru. (See table below).																		
Senegal. (See table below.)																		
Siam:																		
Prachin—Nagara Nayok	C									4								
Nagara Rajsima	C																1	
Rajpuri	C										1							
South-West Africa.[9]																		
Union of South Africa: Orange Free State	C			3	3			1	2						[10]39			
On vessel: S. S. *Barjora* at Rangoon from Moulmein	C		1															
	D		1															

[1] Including plague in the United States and its possessions.
[2] During the week ended Mar. 2, 1935, 1 fatal imported case of plague was reported at Amoy, China.
[3] A report dated Jan. 29, 1935, states that up to Jan. 23, 79 cases of plague with 78 deaths were reported near Kangping, China; the reports also states that up to Jan. 21, 50 deaths from plague were reported in 6 villages of the Pe Wang Fu District, northwest of Kangping.
[4] A report dated Oct. 30, 1934, states that from June to Oct. 25, 1934, deaths from plague had been reported in Manchuria, China, as follows: Fengtien Province—Liaoyuan 30, Shuangshan 21, Tunghao 41, Kirin Province—Changling 12, Chienan 26, Fuyu 32, Hsinking City 1, Nungan 168.
[5] Up to Jan. 5, 1935, 44 cases of plague with 35 deaths were reported at Mansantun, Manchuria, China.
[6] Imported.
[7] For 2 weeks.
[8] During the week ended Mar. 9, 1935, 1 plague-infected rat was reported 10 miles from Kahului, Makawao district, Maui Island, Hawaii Territory.
[9] From January to Oct. 31, 1934, 33 cases of plague were reported in Ovamboland, South-West Africa.
[10] For 4 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		August 1934	September 1934	October 1934	November 1934	December 1934	January 1935
Argentina (see also table above)	C	6	11				
Azores	C	5	2		1	1	
British East Africa (see also table above):							
Kenya	C	13	5	1	6		
Uganda	C	103	54				
China: Kwangchowan	C	3			3		
	D	8			3		
Indo-China (see also table above):							
Cambodia	D	3	3	4	4	2	1
Cochin-China	C	2	1		2		
Madagascar (central region)	C	160	291	444	431	381	
	D	158	283	422	410	364	
Peru	C	1			2	5	5
Lima department	C		2	3	1	1	1
Senegal:							
Dakar [11]	C	52	17	13	4	2	2
	D	47	19	11	3	2	2
Diourbel [11]	C	5	1				
	D	3	1				
Rufisque [11]	C	42	18	8	4		1
Thies [11]	C	39	6	6			
Tivaouane [11]	C	82	26	21	3	1	

[11] Reports incomplete.

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		July 29–Aug. 25, 1934	Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Week ended— December 1934: 1	8	15	22	29	January 1935: 5	12	19	26	February 1935: 2	9	16	23
Algeria:																		
Algiers Department	C			1												1		
Constantine Department	C		1	1														
Angola. (See table below.)																		
Belgian Congo (see also table below)	C	2	5		102									5				
Bolivia. (See table below.)																		
Brazil:																		
Porto Alegre (alastrim)	C	5	2	1														
Recife	C							1										
Sergipe State	C				P													

British East Africa:																		
Kenya	C	169	116	30	17	5	5	1		2								
Tanganyika	C	6	43	18	14	20	19	15	5	4				2				
British Somaliland	C		7	7	5									8	11			
British South Africa:																		
Northern Rhodesia	C		16															
Southern Rhodesia	C	2	1	2		1												
Canada:																		
Alberta	C				2	1												
British Columbia	C	[1] 1																
Manitoba	C		[1] 1	[1] 1														
Ontario	C																	[1] 1
Saskatchewan	C			2	1													
Canary Islands: Santa Cruz de Tenerife	C					2	1											
Ceylon:																		
Colombo	C		17	3	11		10	1	1		1	1	10	3	1			
Welitara.[2]																		
China:																		
Amoy	C	3			1						1							
Canton	C				3		2	3		4	1	3	2	1	3	1	2	
Dairen	C		2			1				1		4						
Foochow	C	P	P	P	P	P		P		P		P		P		P		
Hankow	C		1	1	1	1	1	1	4	9	10	5	4		10	2	1	
Hong Kong	C		1		2				1	1	1	2	1	4	1	5	2	1
Macao	D				3	4	10	4	15	10	12	17	13	5	12	12	20	9
Nanking	C							1					1		1			
Shanghai	C	3	1	2	1		2	3	1	2					2	1		1
Swatow	C	1																
Tientsin	C			2	3	1	1	3		2	1	2	2	1	3			
Tsingtao	C	1		1	3					2		9	1	1				
Chosen. (See table below.)																		
Colombia	C											[1] 11			20	1		
Dahomey. (See table below.)																		
Dutch East Indies: Balei	C													4				
Ecuador. (See table below.)																		
Egypt:																		
Alexandria	C	2																
Cairo	C	4	1															
Dakahliya	C														56	18		
Faiyum	C		1															
Minya	C	3	2															
Sharkiya	C			74														
Provinces	C	31	13	46	3				2				2	2				
Eritrea	C	1																
Formosa	C											P						
France. (See table below.)																		
French Somaliland	C												5	6	6	6	2	2

[1] For 2 weeks.
[2] A report dated Mar. 7, 1935, states that from Jan. 31, 1935, 20 cases of smallpox were reported at Welitara, Ceylon.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 29–Aug. 25, 1934	Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Week ended— December 1934: 1	8	15	22	29	January 1935: 5	12	19	26	February 1935: 2	9	16	23
Great Britain:																		
England and Wales	C		1	1	1													
London	C			1														
London and Great Towns	C		1	1														
Greece: Salonika	C	8		3							1							
Guatemala. (See table below.)																		
Honduras:																		
Tegucigalpa	C	4	2															
Tela	C						5	1	1		1		1			5		3
India	C	12,684	8,838	4,421	7,163	2,782	3,147	3,473	3,544	4,136	4,404	4,951	6,564					
	D	3,269	2,108	846	1,431	509	920	862	883	1,015	1,104	1,210	1,433					
Bassein	C	1												1				
	D	1												2				
Bombay Presidency	C	1,134	1,102	628	1,245	413	473	602	787	559	704	1,150	1,316	1,640	1,879			
	D	237	200	152	204	67	113	107	149	142	173	242	288	316	387			
Bombay	C	4	14	8	5		4	1	8	9	7	28	23	29	56	46	75	58
	D	3	6	5	4		2		3	6	5	12	15	9	35	22	25	32
Calcutta	C	7	16	3	4		5	10	22	14	14	12	19	34	20	42	55	73
	D	8	9		1		3	5	15	9	10	9	11	22	16	25	17	15
Chittagong	C																1	
Cochin	C												2		4			2
Karachi	C	6	3						4	3		6		5	4	8	9	11
Madras Presidency	C	3,397	2,920	2,708	2,758	989		950		788	974	1,140	1,656					
	D	616	515	414	446	132		153		123	166	162	221					
Madras	C	19	22	16	5		7	8	2	2	5	7	12	12	14	11	16	7
Moulmein	C																1	
Negapatam	C	4	3	8	3		2	10	2	10	9	10	6	8	10	14	8	11
Punjab	C			5	60	21	80	38	86	50	127	43	73	36	52	41	64	36
Rangoon	C	8	2	3	3		1			2	2	2	10	10	8	34	27	8
Tuticorin	C		3	2			2	1					3	1				
Vizagapatam	C	8	1		16		11	8	5	4	54	4	11	23	29	38	23	43
India (French).																		
Chandernagor	D	2	1															
Karikal	C		1	1	1	2		1	1	9		3		6		3		
Maho	D				3													

Pondichery	C	170	236	99	69	34	30	7	34	27	30	17	21	23	25	24		
	D	103	147	81	45	22	31	6	20	20	20	17	16	17	20	24		
India (Portugese)	C	27																
Indo-China (see also table below):																		
Haiphong	C		1								1							
Pnom-Penh	D	1																
Tourane	C	9	3	4	3	1			1	3	1	1				1	1	3
Iraq	C	5	11	3	1	10		8	13	2	20	16		2	2			
Arbil	C		6	2		1				2		1			2			
Baghdad	C	2	[3]1	1														
Basra	C						1		5									
Mosul liwa	C											7		2				
Italy:																		
Genoa	C	8	2															
Milan	C		2															
Japan	C				1	26	55	33	27									
Kobe	C															1		
Taiwan	D								1	1								
Liberia.[4]																		
Lithuania. (See table below.)																		
Mexico:																		
Allende.[5]																		
Chihuahua	C		1		2	1	2	2	7	5		5	1	1		1	5	2
Mazatlan.[6]																		
Mexico, D. F.	C	6	8	6		1			6									
Monterrey	C	1																
San Luis Potosi	D					1												
Teitipac.[6]																		
Morocco. (See table below.)																		
Mozambique. (See table below.)																		
Nigeria	C	239	215	159	115		142	38	74	74	8							
Lagos	C	3	5															
Nyasaland. (See table below.)																		
Palestine	C					1								2		4		
Persia	C	3	2	7	4	1					22	17	21		3			
Teheran	C	1			2	1	1											
	D		1	1	1								1					
Peru. (See table below.)																		
Poland	C		1	1	1													
Portugal (see also table below):																		
Lisbon	C			2	2					1								
Oporto	C		1		1			1										
Portuguese East Africa. (See table below.)																		

[1] For 2 weeks.
[2] A report dated Mar. 7, 1935, states that from Jan. 31, 1935, 20 cases of smallpox were reported at Welitara, Ceylon.
[3] Imported.
[4] A report states that from February to Sept. 10, 1934, 233 cases of smallpox, with 79 deaths, had been reported in Sanoyea, Liberia. All sanitary measures have been taken.
[5] A report dated Dec. 28, 1934, states that about 48 cases of smallpox, with 5 or 6 deaths, had been reported at Allende, Mexico.
[6] A report dated Aug. 27, 1934, states that smallpox has appeared in the suburbs of Mazatlan, Sinaloa, Mexico; the report also states that 104 deaths from smallpox have occurred in Teitipac, Oaxaca, Mexico.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		July 29–Aug. 25, 1934	Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Week ended— December 1934 1	8	15	22	29	January 1935 5	12	19	26	February 1935 2	9	16	23
Salvador	C	30	12	13	10			[7] 27	1									
Siam	C		32	4	13				20		8	3	12	1				
Bangkok	C												[3] 1					
Sierra Leone	C	80	385	214	[1] 60		[1] 129		[1] 43		[1] 80		[1] 25					
Spain	C	47	29	22	105	7	29	15	14	13	7	4				3	8	
Straits Settlements: Singapore	C			2														
Sudan (Anglo-Egyptian)	C	4	1	1				1		11	2	5	5	1	5	2	1	1
Syria:																		
Beirut	C	2																
Damascus	C				33	26	19		4			6			2			
Provinces	C	32	78	51	116	49	30		18	17	1	18	9		3	1		
Trans-Jordan	C				[3] 1													
Tunisia	C											5						
Turkey. (See table below.)																		
Union of South Africa	C	P	P															
Union of Soviet Socialist Republics. (See table below.)																		

On vessels:

S. S. *Ethiopa* at Rangoon from Madras	1 case	Sept. 3, 1934
S. S. *Ussuri Maru* at Kobe from Dairen	1 case	Sept. 24, 1934
S. S. *Rohna* at Penang from Madras	1 case	Oct. 4, 1934
S. S. *Erinpura* at Rangoon from Madras	1 case	Oct. 8, 1934
S. S. *Kwang-Si* at Jibuti	1 case	Nov. 24, 1934
S. S. *Varela* at Basra	1 case	Dec. 8, 1934

On vessels—Continued.

S. S. *Talma* at Hong Kong	Present	Jan 19, 1935
S. S. *Aorangi* at Sydney from Vancouver	1 case	Jan. 24, 1935
S. S. *Ilosang* at Singapore from Osaka	1 case	Feb. 2, 1935
S. S. *Mongolia* at Suez from Australia	1 case	Feb 24, 1935
S. S. *Tatsuta Maru* at San Francisco	1 case	Mar. 14, 1935
S. S. *Tatsuta Maru* at San Francisco	1 case	Mar. 15, 1935

[1] For 2 weeks.
[3] Imported.
[7] For 3 weeks.

Place	August 1934	September 1934	October 1934	November 1934	December 1934	January 1935
Angola ... C	65	33				
Belgian Congo (see also table above) ... C	204	183	184	110		
Bolivia ... C	136	70	72	53	35	
Chosen ... C	5	15	40	38	15	
Dahomey ... C	31	10	6	1		
Ecuador ... C	9	16				
France ... C	3	2	3	53	57	31
Guatemala ... C	1		2	1	2	
Indo-China (see also table above) ... C	150	87	202	259	280	605
D	39	13	39	22	25	67
Lithuania ... C					1	
Morocco ... C	2	8		7	5	
Mozambique ... C	4	6	1	36		
Nyasaland ... C	16	29	17	29	13	
Peru ... C	100	12	195		36	
Portugal (see also table above) ... C	60	36	104	150	99	
D	6	2	6	27	16	
Portuguese East Africa ... C	4	6	1	36		
Turkey ... C	4	16	2	2	5	5
Union of Soviet Socialist Republics ... C	408					

TYPHUS FEVER

Place	July 29–Aug. 25, 1934	Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Week ended— November 1934: 3	10	17	24	December 1934: 1	8	15	22	29	January 1935: 5	12	19	26	February 1935: 2	9	16
Algeria:																			
Algiers Department ... C	1		4	2	1	1				2			2	1	1	1	1		
Constantine Department ... C	12	5	4					1			8	5	3	4	2	3	3	11	6
Bone ... C	1	1														2			
Constantine ... C			2				2	1						1				2	1
Oran Department ... C	10							1	1										
Basutoland ... C		20	46	8	7	6	7	3											
Belgian Congo ... C	108	62	20	4	4	1	3		2		2		1	3					
Bolivia. (See table below.)																			
British East Africa: Uganda ... C	1			10					1									4	
Bulgaria ... C			7			5	2		4	3	4	2			8	2	1		
Chile ... C	1,188	1,408	1,614							355									
Concepcion ... C		14								5									
Iquique ... C			[1] 4																
Santiago ... C	185	430							845	86									
Tocopilla ... C		1																	
Valparaiso ... C	21	21	17	10	9	6	8	16	15	15	8	14	4	11	6	1	5	1	

[1] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		July 29–Aug. 25, 1934	Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Week ended— November 1934				December 1934					January 1935				February 1935		
					3	10	17	24	1	8	15	22	29	5	12	19	26	2	9	16
China:																				
Hankow	C			1																
Shanghai	C		1							2	1		1							
Tientsin	C															1				
Chosen. (See table below.)																				
Colombia	D															1				
Czechoslovakia. (See table below.)																				
Egypt:																				
Alexandria	C	1		1							1				1				1	2
Aswan	C							2	2	1										
Beheira	C	31	1						3		2	4	8	8	14			44	23	
Beni-Suef	C																		3	
Cairo	C							1					1		1					3
Dakahliya	C	7						1							4		6	3	15	
Damietta	D			1							1									
Faiyum	C			1																
Gharbiya	C	22	3	1				6		1		2	3		4		20	38	41	
Giga	C	1													1					
Minufiya	C	5					4	11	4	2	3	11	1	1	2			4	7	
Minya	C	1																		
Port Said	C					1		1				1	1					1		
Qena	C	6		3				1		2	2		2							
Sharkiya	C	3	1							1					1		6	4	7	
Provinces	C	98	35	10	2		5	22	9	7	9	18	16	9	27	39	68	87	95	
Estonia	C	1																		
Greece (see also table below); Salonika	C	6	2	3	1	1	1	1	1	1	1	1	1							
Guatemala. (See table below.)																				
Hungary	C		1						6		1		1			1				1
Iraq:																				
Baghdad	C	3	1	1						1										
Mosul liwa	C	3	3																	
Irish Free State: Waterford County—Lismore	C		1	1																
Italy: Leghorn	C	2	4	1																
Japan:																				
Aomori Prefecture	C	3	1																	
Kobe	C			1																

Latvia. (See table below.)																				
Lithuania	C	7	2	3		1			1	8	4		3	3	7		9	7	14	6
Mexico:																				
Guadalajara	D		1																	
Mexico, D. F.	C	34	26	14					3	18	7	8								
Saltillo	D		2	1																
San Luis Potosi	D			2																
Torreon	C	1		5			1					1	1							1
Morocco	C	43	1		1				7	2	6	1	1		3	3	1		4	6
Palestine	C	1	3	4										2						
Haifa	C	1	1	4			[1] 2	[1] 2		2		1	1							1
Jaffa	C										1			2						
Persia	C	49	47	19	10	5		3	5	10	25	19	9	22		21	16	12	8	
Teheran	C	7	10	1													1			
Peru. (See table below.)																				
Poland	C	77	53	48	14	12	16	19	27	12	38	33	14	34	36	60	69	69	82	57
	D	6	1	5	2	1	3	3	4	3	1	1	1	3	1	6	7	4	3	8
Portugal (see also table below):																				
Oporto	C		1							2										
Tarouca (near)	C														26					
Rumania. (See table below.)																				
Spain	C		1																	
Straits Settlements: Singapore	C													1						
Syria: Beirut	C	1																		
Trans-Jordan	C	4																		2
Tunisia:																				
Tunis	C	1		1	1				3				1							
Provinces	C	14	13	22	18	1	14	2	10	1	8	21	16	9	2	18	20	10	14	25
Turkey. (See table below.)																				
Union of South Africa. (See table below.)																				
Union of Soviet Socialist Republics. (See table below.)																				
Yugoslavia. (See table below.)																				

Place		August 1934	September 1934	October 1934	November 1934	December 1934	January 1935
Bolivia	C	91	33	46	40	103	
Chosen	C	23	7	22	41	29	
Czechoslovakia	C					7	
Greece	C	10	7	6	5	15	
Guatemala	C	36	31	18	18	21	31
Latvia	C			3		8	2
Peru	C	24	83	86	52	17	
Portugal	C	4	7	10	8	27	
Rumania	C	24	16	45	55	127	178

Place		August 1934	September 1934	October 1934	November 1934	December 1934	January 1935
Turkey	C	22	10	16	20	32	22
Union of South Africa:							
Cape Province	C	272	437	407	223	163	
Natal	C	15	6	29	4	8	
Orange Free State	C	510	492	403	309	296	
Transvaal	C	12	105	32	39	29	
Union of Soviet Socialist Republics	C	1,297					
Yugoslavia	C	27	12	31	3	17	53

[1] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		July 29–Aug. 25, 1934	Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Week ended— November 1934: 3	Nov. 10	Nov. 17	Nov. 24	December 1934: 1	Dec. 8	Dec. 15	Dec. 22	Dec. 29	January 1935: 5	Jan. 12	Jan. 19	Jan. 26	February 1935: 2	Feb. 9	Feb. 16
Brazil:																				
Ceara State: Iguatu	D	1																		
Mato Grosso State: Coronel Ponce.[1]																				
Colombia: Intendencia of Meta—Restrepo	D							3						1			3		2	
French Equatorial Africa: Middle Congo—Pointenoire.[3]																				
French West Africa—Guinea—Kindia	C		1																	
Gambia:																				
Bathurst	C						1					2		1						
St. Mary's Island	C						[3] 2													
Gold Coast:																				
Aperadi	C														2	1				
	D														1					
Kokobee	C							1												
Oda	C														1					
Wenchi	C						1													
Ivory Coast:																				
Abidjan	C		1																	
Agboville	C		1																	
Banguoanou	C																	1		
Bingerville	C	1																		
Bobo-Diolasso [4]	D			([3]) 1																
Dibro	C									3										
	D									1										
Diekakro	C										1									
Dimbokro	C															1				
Gagnoa.[5]																				
Ouagadougou.[4]																				
Tirailleur	C			1																
Toumodi	C									15			1							
	D									10										
Zuenoula	C									1										

Nigeria:																				
Kano	C										2			1						
Quellam Maduri	C																[3] 1			
Niger Territory:																				
Maradi	C		1																	
Zinder	C	5		1											1					
	D	4		1																
Sierre Leone: Hill Station (near Freetown)	C														[3] 1					

[1] During the month of October 1934, 1 case of yellow fever was reported at Coronel Ponce, Mato Grosso State, Brazil.
[2] During the week ended Mar. 16, 1935, 2 cases of yellow fever were reported at Pointenoire, Middle Congo, French Equatorial Africa.
[3] Suspected.
[4] During the week ended Feb. 23, 1935, 1 case of yellow fever was reported at Bobo-Diolasso, Ivory Coast, and 1 case of yellow fever at Ouagadougou, Ivory Coast.
[5] During the week ended Mar. 2, 1935, 1 case of yellow fever was reported at Gagnoa, Ivory Coast.

X

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PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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PUBLIC HEALTH NURSING IN A BI-COUNTY HEALTH DEPARTMENT[1]

Brunswick-Greensville Health Administration Studies No. 4[2]

Prepared by PEARL McIVER, *Associate Public Health Nursing Analyst, United States Public Health Service*

INTRODUCTION

In the first article published on the Brunswick-Greensville (Va.) study,[3] Mountin raised four fundamental questions which need to be answered by the health administrators in every community. These questions are:

1. What are the health problems of the people in the community?
2. What is the quality and the quantity of the service rendered by the health department?
3. What relationship exists between the services rendered and the needs of the people?
4. What specific effect does the health department procedure have on the individual health problems?

In the present article, a description is presented of the Brunswick-Greensville (Va) Health Department nursing service covering a continuous period of 12 months, together with a summary of its extent and distribution. Types of service and factors which governed their selection are considered here in a general way, but will be dealt with in more detail in later articles, when consideration will also be given to quality and the effect of specific nursing procedures.

A complete description of the Brunswick-Greensville area may be obtained from the first article in this series. However, a brief résumé

[1] From the Office of Studies of Public Health Methods, in cooperation with the Division of Domestic Quarantine.

[2] The collection of most of the material was supervised by Helen C. Brennan, special nurse, U. S. Public Health Service. Acknowledgment is due Marian G. Randall, of the Milbank Memorial Fund, who assisted in setting up the study. The writer expresses appreciation to Marian G. Randall, to Lillian A. Hudson, Teachers' College, Columbia University, and to Katherine Tucker, general director, National Organization for Public Health Nursing, for their advice and criticism on the analysis of the material.

[3] Mountin, Joseph W.: Effectiveness and economy of county health department practice. Pub. Health Rep., vol. 49, no. 42, Oct. 19, 1934.

will be given here. The total population of the area in 1930 was approximately 34,000, about 20,000 in Brunswick County and about 14,000 in Greensville County. There were 4 incorporated villages within the 2 counties, and, if these villages were excluded, the population per square mile would be approximately 34. Fifty-eight percent of the population was colored. Agriculture was the chief industry, and the main crops were cotton, tobacco, wheat, peanuts, and corn. The taxable resources of the area were low, the assessed valuation being but $15,000,000, while the per capita income [4] in 1933 was $147 in Brunswick County and $134 in Greensville County. Vital statistics for the intercensal [5] period (1921–30) previous to the study reveal conditions which are very similar to those in neighboring counties in Virginia and North Carolina. The gross mortality rate for the period 1921–30 was 11.2 per thousand; the infant mortality rate was 71.4; the stillbirth rate, 46.5; the maternal mortality rate, 6.0; and the rate for tuberculosis, 106.0. Intestinal infections presented problems of importance, since the typhoid fever death rate was 11.0 and the death rate from diarrhea and enteritis in children under 2 years of age was 41.0 per 100,000 population The above rates were high among the colored as compared with the white population.

Eighteen physicians and five dentists, engaged in active practice, resided within the area but there were no hospitals of any type in either county. About 75 percent of the births were attended by midwives. None of the midwives had had any special training in midwifery. The welfare work in each county was handled by a county poormaster and by various volunteer church groups. Trained social workers were not employed.

The bi-county health department was under the direction of a whole-time medical officer who served both counties but maintained headquarters in Brunswick County. One nurse was assigned to each county. The sanitation officer, who lived in Greensville County, served the entire area. A part-time clerk was stationed at the main office in Brunswick County. The State health department furnished a consultation service to local health department personnel, and, at the time that this study was made, visits by the State advisory nurse were made to each county about once every quarter. The State health department advised the nurses to spend one-fourth of their time on tuberculosis work, one-third on the maternal and infant hygiene program (including midwife supervision), and the remainder on the other health problems. Virginia (under the West law) required the teachers to make the annual physical inspections of school children; and while the teachers were privileged to seek help

[4] Sales management, April 1933.

[5] Total birth and total death rates per 1,000 population, stillbirth, infant mortality, and maternal mortality rates per 1,000 live births; other death rates per 100,000 population.

from the nurses, routine physical inspection on the part of the nurses was discouraged by the State health department. Very little bedside nursing was done by the public health nurses, even as a demonstration.

METHOD OF STUDY

While the nurses in the health department had been keeping records which were regarded locally as sufficient for administrative purposes, it was found that the information desired in connection with the study could not be obtained from the forms then in use. Consequently, specially designed record forms were prepared which would meet the added requirements of the study. Detailed case records were completed for those persons seen by the nurse either in the home or the office and for whom a continuing service was planned. On those individuals, information was obtained which conformed in a general way to the following classification:

1. Identification of the individual, as to family, age, color, type of case, economic status, and location of the family home.
2. Source of information about the individual Did patient send for the nurse? Was the case reported by a physician, a midwife, or a neighbor? Did the nurse discover the case while visiting the home for another purpose?
3. Reason for first visit. Was the reason for visiting the patient his most important health problem? What were the nurse's objectives?
4. Place of service. Was the service rendered in the patient's home, at the health department office, or in the school?
5. Type of service. What was the character and extent of the service rendered?
6. Effect or result of service. Was the nurse's objective realized? Was the patient's need satisfied?

A list of the individuals who were visited in regard to other patients or who were seen in behalf of the health program was made out each day. When the study was begun, it was reported that comparatively little health work was done by the nurses in the schools beyond group inspections; consequently, individual case records were not provided for the school contacts. The records of the school work gave the number of schools visited, the purpose of each visit, and the total contacts made each time the school was visited. The number of persons according to age group and color was obtained for those examined in connection with the "preschool round-up" and the number of those who were immunized. For the public health classes, the number of class sessions and the attendance per session were recorded.

EXTENT AND DISTRIBUTION OF NURSING SERVICE

According to the available records, the number of nursing services at various places during the study year is shown in table 1.

TABLE 1.—*Distribution of individual services according to type of service*

Type of service	Brunswick County	Greensville County	Total
Immunization clinics	2,455	2,163	4,618
School visits	1,032	1,773	2,805
Home visits	1,044	481	1,525
Health office conferences	276	221	497
Clinics (tuberculosis, orthopedic, etc.)	324	165	489
Nursing classes	83	70	153

There was a total of 10,087 services at the various places during the year. From data available it was not always possible to identify individuals who were served in the schools, at the immunization clinics, and who attended the home nursing classes. It is quite possible that some of those contacted in the schools were also immunized, as the greater part of the immunization work was done among the school-age group. On the other hand, only 208 children of the school-age group received home visits; therefore, there were very few individuals, if any, who received service both at school and at home.

From the available data, it is possible to give only an estimate of the total number of individuals who received some type of nursing service during the year. Allowing for all probable duplications, it is safe to estimate that 7,500 of the 10,087 services recorded represent different individuals. Since the population of the area was approximately 34,000, this would indicate that the nurses gave one or more types of service to approximately 22 percent of the total population of the area.

IMMUNIZATION SERVICE

A special diphtheria prevention campaign, sponsored by the State health department, was conducted during a part of the study year. For a period of about 6 weeks' practically the entire time of the nurses was devoted to this work. The nurses made the preliminary arrangement for the clinic by visits to the schools and other centers and assisted the health officer at the clinics. All clinics were conducted under the direction of the health officer or a local practicing physician, although not infrequently the nurses did part of the actual immunization work alone. One hundred and fifteen diphtheria immunization clinics were conducted in the two counties and 2,279 children were given the complete dosage of toxin-antitoxin or toxoid during the study year.

TABLE 2.—*Immunization clinics with which the nurses assisted during the study year and the number of individuals who were immunized at the clinics*

Type of clinic	Brunswick			Greensville			Total immunized		Grand total	
	Number of clinics	Number immunized		Number of clinics	Number immunized		White	Colored	Number of clinics	Number immunized
		White	Colored		White	Colored				
Diphtheria	78	647	280	37	83	1,269	730	1,549	115	2,279
Typhoid fever	11	395	166	11	220	179	615	345	22	960
Smallpox	100	186	781	53	42	370	228	1,151	153	1,379
Total	189	1,228	1,227	101	345	1,818	1,573	3,045	290	4,618

Typhoid fever immunization clinics were held at various times during the spring and summer and 960 complete immunizations were given. Smallpox vaccination was given to 1,379 persons during the year; 83 percent of them were colored school children who were vaccinated as a requirement for school attendance. Table 2 summarizes the work which the nurses did in connection with the immunization program.

SCHOOL HEALTH SERVICE

A large majority of the 2,805 contacts made in the schools represent individual pupils, since only a few schools were visited more than once during the year. However, the Emporia school in Greensville County was visited 63 times during the year. This school was the largest in the county and it is quite probable that some of the individuals were seen on several different occasions.

Teachers, under the West Law, were required to make the preliminary inspection of the pupils in Virginia. However, the majority of the nursing contacts in the schools were for the purpose of assisting the teachers in the inspection of pupils for physical defects. Approximately 65 percent of the individuals seen in the schools received this service. Inspections for symptoms of communicable disease were the purpose of about 33 percent of the school contacts. The remaining school contacts were parents or teachers who were interviewed in behalf of individual pupils or who were consulted regarding clinic schedules.

The inspections in one of the larger schools were made jointly with the health officer, but most of the school contacts were made by the nurses alone.

CLINICAL SERVICE

Seven tuberculosis clinics (4 in Brunswick County and 3 in Greensville County) were conducted by a clinician from the State health department. The local health department nurses made the necessary preliminary visits in connection with the arrangements for these clinics and assisted the examining physician during the clinic. Two hundred and forty-four individuals attended one or more of the tuberculosis clinics during the year.

The orthopedic clinics were sponsored by local service clubs, and usually one clinic was held in each county each month. The health department nurses assisted the orthopedic surgeon during the clinics and gave follow-up care when indicated. Twenty-three orthopedic clinics were held during the year, and 200 patients were registered. The total number of visits to the orthopedic clinics was 540, giving an average of 2.7 visits per individual.

One tonsillectomy clinic, arranged by the county health department, was held in Brunswick County, and 28 children were operated on. This clinic was financed in part by charging those who were able to pay a minimum fee. The operations were performed by a nose and throat specialist from outside the county. Most of the preliminary work in connection with this clinic was done by the Brunswick County nurse, but both nurses assisted during the clinic.

In accordance with the general policy advocated by the State health department, practicing physicians made the physical examinations in connection with the "preschool summer round-up." The services of the public health nurses were available to any physician who desired help in this work. The usual plan was for each physician to set aside a day and to invite all of the preschool children from among his clientele to attend. The public health nurse then arranged to be at his office to assist with the examinations. The Brunswick County nurse assisted with six preschool clinics of this type, and 27 preschool children were examined. The Greensville County nurse had no such preschool clinics during the study year, owing to the fact that, at that time, the plan had not been endorsed by the medical profession of the county.

GROUP TEACHING

Two home hygiene classes for girls of high school age were organized during the study year. The Brunswick County nurse conducted a class for white girls and the Greensville County nurse had one for colored girls. About 55 girls were enrolled in these classes.

Each nurse was expected to hold regular classes of instructions for the colored midwives. The Brunswick County nurse had 12 meetings with her group during the year, but the Greensville County group met but twice. The attendance at the midwife classes was usually about 25, but not all those attending were midwives. Any colored woman interested in maternity work was welcome to attend.

During the year the nurses organized 7 mothers' study clubs under the direction of local leaders. About 48 women were enrolled. The plan of study and the educational material were supplied by the State health department. The course of study emphasized prenatal, infant, and child care. After organizing the classes, the nurses gave demonstrations from time to time and assisted the club leaders in

other ways. As a rule the nurses attended about three sessions of each club.

Meeting with women's clubs, parent-teacher associations, the Red Cross, and other groups was another activity of the nurses. The nurses addressed groups of this type 29 times during the year. In addition to these meetings, each nurse attended two professional conferences.

HOME VISITING

Separate case records were opened for 1,114 of the 1,525 individuals who were contacted in the homes. From the daily reports it was observed that most of those for whom no case records were made were visited on behalf of other patients or in the interest of the health program, and no specific service was rendered to those individuals by the nurses.

While the 1,114 individuals for whom case records were opened represent only about 15 percent of the total number of individuals who were contacted by the nurses, those individuals were the recipients of a large part of the nursing time and service. This may be expected, since home visiting, though time consuming, should be an important part of the nurse's work if the selection of cases for home visitation is based upon real need for service. It is through these home contacts that the nurse discovers true family problems and interprets the medical and sanitary procedures to the family.

FACTORS WHICH APPEARED TO INFLUENCE THE SELECTION OF INDIVIDUALS FOR HOME VISITATION IN BRUNSWICK-GREENSVILLE COUNTIES

1. *Economic status* appeared to be one factor which influenced the selection of families for home visiting. This might be expected, since most studies of public health nursing services have indicated that the need for nursing service of the type rendered by health departments and other community health agencies varies inversely with the economic well-being of the family.

The 1,114 individuals who were included in the home visiting service represented 546 families. Of the 516 for whom economic status was recorded, 365, or approximately 77 percent, were classified as "poor" or "very poor." Those families who were unable to provide themselves with food, clothing, and shelter were classified as "very poor", while those who were able to provide themselves with these three essentials, but not with medical or dental care, and had none of the usual comforts, were classified as "poor". In the family study,[6] which included a representative sample of the population in those counties, approximately 50 percent of the families were classified as poor or very poor.

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[6] Unpublished data obtained through a survey of a repreesntative group of 1,009 families.

2. *The size of family,* and particularly the presence of young children in the home, also appeared to have been a selective factor. The average size of family for this area, according to the United States census, was approximately five. Among the families visited by the nurses it was found that 61 percent of them had 5 or more per household and that in 19 percent of the households there were 9 or more individuals. From the family study,[7] it was found that there were children in approximately 74 percent of the homes. The nursing records show that there were children in more than 80 percent of the homes visited by the nurses. There were infants or preschool children in 68 percent of the homes visited by the nurses, while in the family study,[7] there were infants or preschool children in only 46 percent of the homes. The congregating of large numbers in one household, especially if there are many children within the group, usually increases the number of health problems. Apparently the size of the family, and particularly the presence of young children in the home, was a factor which influenced the selection of families for visitation.

3. *The age of the individual* was a definite selective factor in determining which persons in the household were to be given nursing service. While only 3.2 percent of the total population received home nursing visits during the year, when those who received service were separated into age groups it was found that approximately 11 percent of all of the infants in the county were visited during the year, as compared with 4 percent of the preschool age group, 2 percent of the school children, and 3 percent of the adults. Of these age periods, the infant group presents the largest number of problems and perhaps benefits most from public health nursing service; consequently, it would appear proper to give relatively more nursing service to this group. Table 3 gives the percentage of the total population receiving home visits from the nurses, according to age groups.

TABLE 3.—*Percentage of total population receiving home visits from the nurses according to age groups*

Age group	Brunswick				Greensville				Total				Grand total	
	White		Colored		White		Colored		White		Colored			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Infants [1]	48	12.9	68	11.9	13	7.0	43	10.4	61	10.9	111	11.3	172	11.1
Preschool children	72	6.0	73	4.4	27	4.5	14	1.2	99	6.0	87	3.1	186	4.2
School children	55	2.4	80	2.2	26	2.1	47	2.0	81	2.3	127	2.1	208	2.2
Adults	147	2.7	159	2.7	68	2.0	174	3.9	215	2.4	333	3.2	548	2.9
Total	322	3.5	380	3.2	134	2.5	278	3.3	456	3.1	658	3.3	1,114	3.2

[1] Percentage of infants receiving home visits by the nurse is based on an estimated infant population—number of children under 1 year of age at beginning of study year plus the live births occurring during remainder of the study year.

[7] See footnote 6.

4. *Type of case* was another factor which apparently influenced the selection of families for visiting. Data on the allocation of time to the various services were not available; but it appears that the recommendations of the State health department were followed in a general way, since 25 percent of the individuals visited were listed as tuberculosis cases, contacts, or suspects, and 20 percent of the individuals were maternity cases. The infant and preschool health supervision group made up approximately 23 percent of the cases. Thus, from the standpoint of the number of cases visited, the maternal and infant

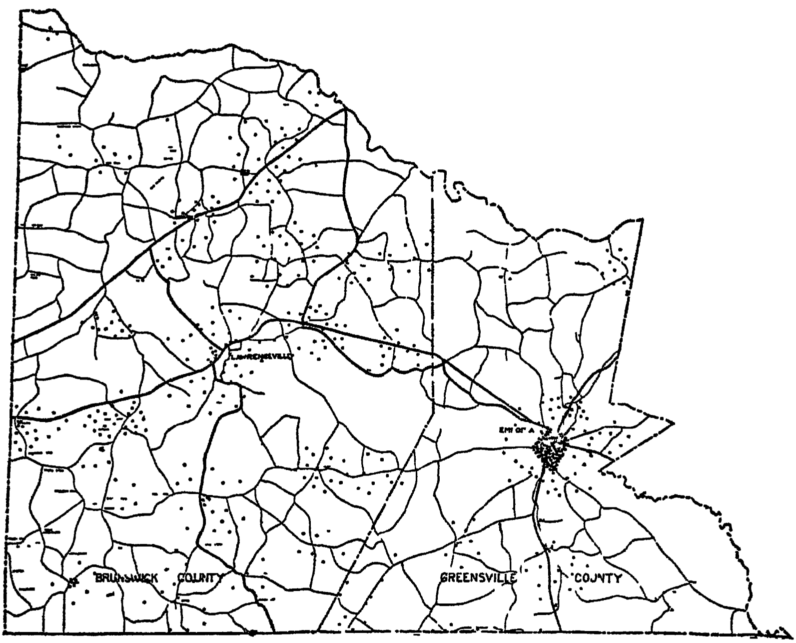

FIGURE 1.—Location of the 546 families visited by the public health nurses during a study period of 12 months.

hygiene and tuberculosis problems were undoubtedly selected for special consideration.

5. *The location of the family home* is often a selective factor. Those homes on the highways or near the nurse's headquarters sometimes received more visits from the nurse than those located in remote areas, because of the ease with which they may be reached. To some extent this was true in Greensville County. Forty-nine percent of the homes visited by the Greensville County nurse were located in the county seat, where she resided, although only about 15 percent of the total population of the county lived within the county seat. The distribution of homes visited by the Brunswick County nurse appeared to be quite evenly distributed. Only 5 percent of the homes she visited were located in the county seat, which contained about 10 per-

cent of the population. Eighty-five percent of the homes visited in Brunswick County were located in the open country. Figure 1 shows the location of the homes visited by the nurses during the study year.

SOURCE OF INFORMATION WHICH LED TO HOME VISITS

Of the 546 families who were visited by the nurses, about 42 percent of the first visits to the family were made at the request of some member of the family. In some instances the parents or the patients themselves came or wrote to the health department requesting advice or service. In other instances some member of the family attended a clinic or a class conducted by a member of the health department staff, learned about the available services, and informed the nurses about their needs Midwives referred about 19 percent of the families to the health department, and neighbors were the source of information in about 18 percent of the families. Physicians requested the nurses to make the first visit to 10 percent of the families.

In considering the source of first information about individual cases, it was shown that approximately 37 percent of the cases were found when visiting some other member of the family. It is usually assumed that when a nurse visits a home she makes a family health visit In the majority of homes there is likely to be more than one member of the family in need of health supervision of some type. If the nurse recognizes her opportunities and is alert to discover health needs, it may be assumed that, in families where there are several members, more than one will receive advice or service when the nurse visits the home. Observation of nurses in the field proves that most nurses do more work than their records indicate. Frequently a record will be made out for the most important case and no mention will be made of the services rendered to other members of the family. The nurses in Brunswick and Greensville Counties were urged to record all of the services rendered upon every visit, but from table 4 it is quite evident that they either served but one individual on 57 percent of their visits or failed to make a record for the other persons served.

TABLE 4.—*Distribution of nursing visits to the homes according to the number of individuals seen on each visit*

Number of individuals seen per visit to the home	White		Colored		Total	
	Number of visits to home	Percent of visits	Number of visits to home	Percent of visits	Number of visits to home	Percent of visits
1	185	51.0	365	60.1	550	56.7
2	99	27.3	149	24.6	248	25.5
3	39	10.7	49	8.1	88	9.1
4	18	5.0	13	2.1	31	3.2
5	6	1.6	13	2.1	19	2.0
6 or more	16	4.4	18	3.0	34	3.5
Total	363	100.0	607	100.0	970	100.0

REASON FOR FIRST VISITS TO HOMES

The reason for the first visits to 40 percent of the homes was maternity care or instruction. The control of tuberculosis was the reason for the first visit to approximately 16 percent of the homes. Advice and care of patients suffering from chronic illnesses such as pellagra, rheumatism, or heart conditions accounted for about 20 percent of the first visits to the homes. While very little actual nursing care was given to these patients, arrangements for medical care were frequently made by the nurses and special instructions on diet and hygiene were given. The control of communicable disease accounted for but 6 percent of the first visits to the homes, although approximately 11 percent of the total number of individuals visited were listed as communicable-disease cases or contacts. General[8] health supervision, which is usually considered a major function by most health departments, was the reason for the first visit to but 6 percent of the homes.

NUMBER OF VISITS PER HOME AND PER CASE

In all, 1,148 visits were made to the homes of the 546 families who received nursing visits, an average of 2.1 visits per home. Approximately 46 percent of the homes were visited but once, but a few homes were visited from 14 to 19 times during the year.

While an average of 2 visits was made to each home, the number of visits per individual case was less—1.3. Approximately 57 percent of the individuals seen received but one visit during the year. It might be assumed that the same factors which appeared to influence the selection of families and individuals for visiting would also influence the number of return visits. Those families in the "very poor" economic group did receive a slightly higher average number of visits per case, but location of the family home did not appear to affect the number of return visits.

There was a slight difference in the average number of visits to various types of cases. The communicable-disease cases, with an average of 2.2 visits per case, came first. General health-supervision cases,[8] with an average of 1.4 visits per case, had the lowest number. The tuberculosis and maternity cases were visited on an average of 1.8 times each. Fifty-nine percent of the maternity cases received but one visit and that was during the antepartum period.

With but two nurses to render all types of public health nursing service to a population of 34,000, the service to the individual must necessarily be limited. When the size of the staff is inadequate to meet all of the community needs, two alternative objectives are

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[8] Includes services to infants, preschool and school children, and adults, except communicable disease and tuberculosis control and maternal hygiene.

presented: Shall the nurses aim to reach the largest possible percentage of the population who need health service or shall an intensive service be rendered to the few who present acute problems which can be influenced most readily by the nursing program? There is danger in "stretching" and "thinning" the service until the results are of doubtful value. However, a tax-supported department has certain general responsibilities which must be discharged irrespective of other considerations. These responsibilities are more or less fixed and therefore consume relatively more time when the staff is small. The percentage of the total population visited by the Brunswick-Greensville nurses nevertheless compared quite favorably with the percentage reached by the nurses in Cattaraugus County, N. Y.,[9] and in Rutherford County, Tenn.[10] However, the intensity of the service was necessarily much less, since the population per nurse in both of those counties was approximately 6,000, or about one-third as great as it was in the Brunswick-Greensville area.

Other features of the nursing service in the Brunswick-Greensville area will be presented in four additional articles. These articles will deal with the contributions of the nurse to maternal hygiene, tuberculosis control, prevention and control of acute communicable diseases, and general health supervision.[11] The discussion of each branch of the nurse's work will be developed along similar lines and will include type and extent of program, source of first information about cases, economic status of beneficiaries, apparent effect of the nursing procedures, and the relationship between types of service rendered by the nurses and the need for nursing service.

STUDIES OF SEWAGE PURIFICATION

I. APPARATUS FOR THE DETERMINATION OF DISSOLVED OXYGEN IN SLUDGE-SEWAGE MIXTURES *

By EMERY J. THERIAULT, *Principal Chemist*, and PAUL D. MCNAMEE, *Assistant Chemist, United States Public Health Service, Stream Pollution Investigations Station, Cincinnati, Ohio*

Research activities at the Stream Pollution Investigations Station of the United States Public Health Service in Cincinnati, Ohio, have recently been centered on the elucidation of one of the weakest links in the activated sludge process, namely, the troublesome condition, occasional or otherwise, of poor settlement generally designated as the

[9] Randall, Marian G Public-health nursing service in rural families Milbank Memorial Fund Quarterly, vol IX, no 4, October 1931, p 192

[10] Mustard, Harry S : Cross section of rural health progress Commonwealth Fund, New York City, 1930, p. 221.

[11] See footnote 8.

*Originally printed in the Sewage Works Journal, vol. VI, no. 3, May, 1934, pp 413–422, and reprinted here to bring together all articles of the series.

"bulking" of the sludge.[1] Using a small experimental unit, the approach to this problem has been from the chemical, biological, and physical, or engineering, viewpoints. In either case it has appeared highly advisable to obtain accurate information regarding the dissolved oxygen content of the sludge-sewage mixtures. The development of the apparatus to be described in this paper was accordingly undertaken after the procedures then available had been shown to fail utterly in meeting the severe condition imposed by the presence of sludge.

The governing consideration in the determination of dissolved oxygen in such a highly putrescible material as activated sludge is the uncommonly high oxygen demand of the material itself. Using the apparatus described by Theriault and McNamee (*1*), it can readily be shown that the oxygen demand of sludge-sewage mixtures drawn from aeration tanks may exceed 1 milligram per liter per minute, and this figure may be multiplied by 5 or 10 when sludge drawn from clarification tanks is examined. At ordinary temperatures the dissolved oxygen content of activated sludge will not exceed 9 milligrams per liter; usually it will be much lower. It is clear that time-consuming manipulations should be avoided in the examination of sludge-sewage mixtures for dissolved oxygen.

An artifice which is commonly used consists in eliminating most of the sludge by allowing it to settle. Tests for dissolved oxygen may then be made on the relatively clear supernatant liquor. Some of the sources of error in this procedure, particularly in the collection and handling of the sample, may be avoided by the use of the apparatus described by Küchler (*2*). The procedure of allowing the sludge to settle is, nevertheless, impracticable with "bulking" or poorly settling sludge. Even with "good" sludge the dissolved oxygen content of the supernatant liquor should be appreciably reduced during the initial period of turbulence which precedes settling or by convection currents after settling begins. The interpretation of results is further complicated by surface aeration during settling and by the absorption of atmospheric oxygen in the transfer of the supernatant liquor unless special apparatus is used.

The use of mercuric chloride is recommended by Konstantinowa (*3*) as an inhibitant of biochemical processes during tests for dissolved oxygen in the presence of activated sludge Mercuric chloride is of doubtful efficiency as a sterilizing agent in activated sludge. Moreover, as shown by direct tests, the "immediate", or purely chemical, oxygen demand is not appreciably affected by this reagent. It can also be shown that such a strong oxidizing agent as potassium permanganate will not prevent the loss of dissolved oxygen from freshly prepared dilutions of stale sewage (*cf.* Theriault (*4*)).

[1] These investigations are being conducted under the direction of Sanitary Engineer J. K. Hoskins. Further reports on various aspects of the work will be published from time to time.

As modified by Theriault and McNamee (*5*), the Winkler technique has been successfully applied to the determination of dissolved oxygen in the presence of relatively stable forms of organic matter, such as glucose, even in amounts up to 5,000 p. p. m. (0.5 percent). Reasonably accurate results were also obtained with freshly aerated peptone solutions, up to 600 p. p. m., and with partly oxidized sludge from artificial channels. Huge errors, however, were observed in experiments with unstabilized peptone solutions, and later the method was found to fail altogether in the presence of activated sludge.

From the foregoing survey of the subject it has not appeared that any purely chemical procedure could be used in the important marginal case where the dissolved oxygen content of a sludge-sewage mixture is 1 p. p. m. or thereabouts. The desideratum is evidently a method whereby dissolved oxygen can be separated from activated sludge in a few seconds, instead of in a few minutes. Such a method should provide a record of the momentary situation in the unstable equilibrium maintained by the constant air supply against the unsatisfied oxygen demand of the sludge. Physical methods for the extraction of gases from liquids were accordingly examined.

EXTRACTION OF GASES FROM LIQUIDS

There is a wide choice in the selection of methods for the extraction of gases from liquids. For the purpose at hand, with time as the controlling factor, a method based on the injection of the sample into a highly evacuated space has appeared to be the most practical. The scrubbing out of the dissolved gases with an indifferent gas, such as nitrogen or carbon dioxide, was shown to be effective enough for use with nonputrescible liquids but too time-consuming in dealing with activated sludge. Other methods have appeared to be impractical for field use.

Vacuum extraction with heat was used by Adeney (*6*), in experiments with sewage, and a modification of Adeney's apparatus has recently been proposed by Damany (*7*) for use with boiler waters. This method of extraction is also incorporated in the Van Slyke apparatus (*8*) for the determination of gases in blood.

A disadvantage of the vacuum extraction procedure is that complete removal of the dissolved gases cannot be accomplished without the application of heat or of other auxiliary methods. It will presently be shown, however, that suitable corrections for the failure to achieve 100 percent recovery of the gas can readily be applied in cases where a delay in the analysis is inadvisable, as in work with activated sludge.

ABSORPTION AND ESTIMATION OF OXYGEN

It appeared possible in early experiments that a satisfactory indication regarding the dissolved oxygen content of a sludge-sewage mix-

ture might be based on a simple measurement of the total volume of the gas obtained by vacuum extraction after removing carbon dioxide and applying a correction for the known solubility of nitrogen. Under the conditions of the activated sludge process, the samples should be fully saturated with nitrogen. In practice, reasonably accurate results were obtained with a minimum of manipulations. The computations, however, were tedious and the apparatus was probably too fragile for field work. Similar objections may be raised against the use of most forms of micro-gas-analysis apparatus.

With a view to the avoidance of corrections for variations in temperature and barometric pressure, use was made of a method described by Theriault and Butterfield (*9*). The gaseous oxygen is first absorbed by vigorous agitation in the presence of a suspension of manganous hydroxide. The analysis then follows along lines of the well-known Winkler procedure for dissolved oxygen in the absence of any interfering substances. The results are obtained directly in milligrams without troublesome computations.

THE APPARATUS

In the design of apparatus embodying the principles of vacuum extraction followed by a manganimetric determination of oxygen, it has appeared possible to limit the volume of the sample to 100 ml. Strict accuracy is accordingly sacrificed in favor of portability and convenience in operation. The maximum amount of oxygen available for a test will be 1.0 ml when samples in equilibrium with air at 0° C. are examined. In equilibrium at any temperature, the volume of dissolved nitrogen is approximately twice that of the dissolved oxygen. In work with aerated samples, over 1 ml of gas should be obtained by complete extraction, even though dissolved oxygen is practically absent.

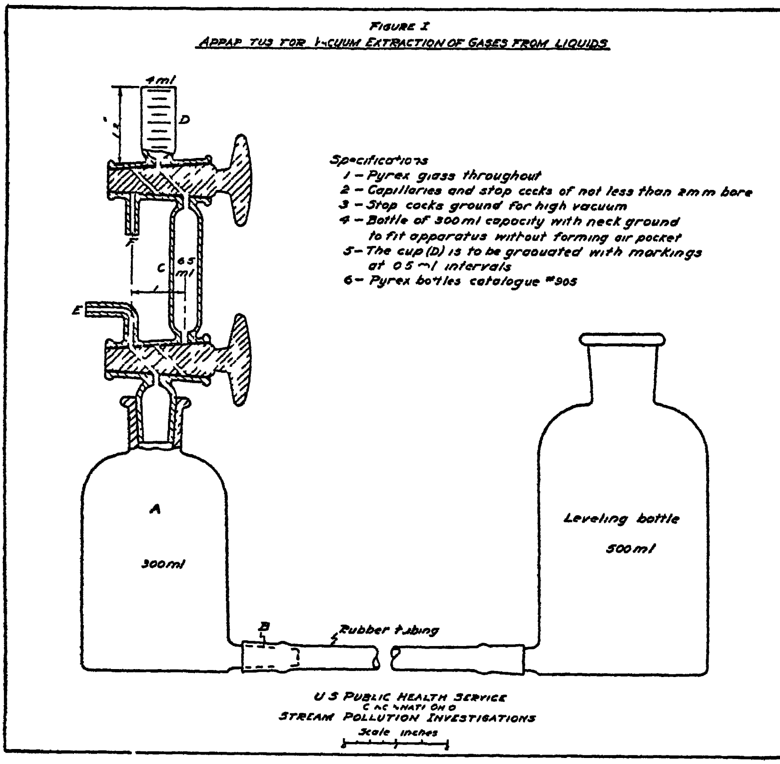
Omitting intermediate steps in its development, the apparatus finally adopted is shown in fig. 1. The evacuation vessel (*A*) consists of a 300-ml aspirator bottle with an outlet (*B*) near the bottom connected by 4 feet of rubber tubing to a second aspirator bottle of 500 ml capacity which serves as a leveling bottle. The gas analysis apparatus consists essentially of a 6.5-ml chamber (*C*) closed at both ends by parallel-bore stopcocks. The upper part of this apparatus is surmounted by a small graduated cup (*D*) and the lower part is ground to fit the evacuation vessel (*A*). Pyrex glass is used throughout. Rubber tubing of the nitrometer variety, size 3/16 by 1/8 inch, has proved very satisfactory.

SAMPLING

For the purpose of minimizing the error due to the loss of dissolved oxygen during sampling, it should generally be advisable to bring the

apparatus to the side of a plant rather than to transport the sample to a laboratory. When air bubbles are absent, as in clarification or settling tanks, a direct connection with glass and rubber tubing should be made between the evacuation vessel and the mixture under examination. This simplification should also be considered in the examination of samples drawn from the lower portions of mechanically aerated tanks.

When air bubbles are present, as in aeration tanks equipped with diffuser tubes or plates, provision must be made for the dissipation of



entrained air prior to the removal of the dissolved gases. No allowance need be made for the re-aeration of the sample during collection, the presumption being that an equivalent result should be obtained by sampling a few feet further towards the outlet of the tank. Under these conditions, a wide-mouthed bottle of 125 ml capacity with an outlet tube near the bottom has appeared to be the most practical type of sampling vessel. The outlet tube is closed with rubber tubing and a pinchcock, and the bottle is suitably mounted on a rod. After dipping at the desired location and depth, the rubber tubing is flushed and a connection is quickly made to the sludge inlet tube (*E*) of the

evacuation apparatus. With proper allowance for the disappearance of air bubbles, this operation should be completed in 15 seconds.

THE MANIPULATIONS

Prior to a test, the stopcocks and ground glass connection are carefully lubricated. Approximately 400 ml of mercury should be present in the aspirator bottles, together with 2 or 3 ml of water above the mercury in bottle (*A*). With the sludge inlet tube (*E*) open to the air, the evacuation vessel (*A*) is then completely filled with mercury by raising the second aspirator bottle to a predetermined level. When the sludge inlet tube is filled with water, the lower stopcock is turned and the mercury is allowed to fill the gas chamber (*C*) until the upper stopcock is reached. The bore of the upper stopcock should be left full of water.

In testing for leakage, the upper stopcock is closed and the leveling bottle is lowered about 30 inches below (*A*) so as to create a Torricellean vacuum. In the absence of leakage, the mercury should again fill all of the evacuated space when the leveling bottle is raised to its original position. As a rule, however, a slight air bubble will be obtained on the first trial, owing to the extraction of gas from the water which covers the mercury. The operation is then repeated. If leakage exists, it may be localized by separate tests of the gas chamber (*C*) and of the evacuation vessel (*A*).

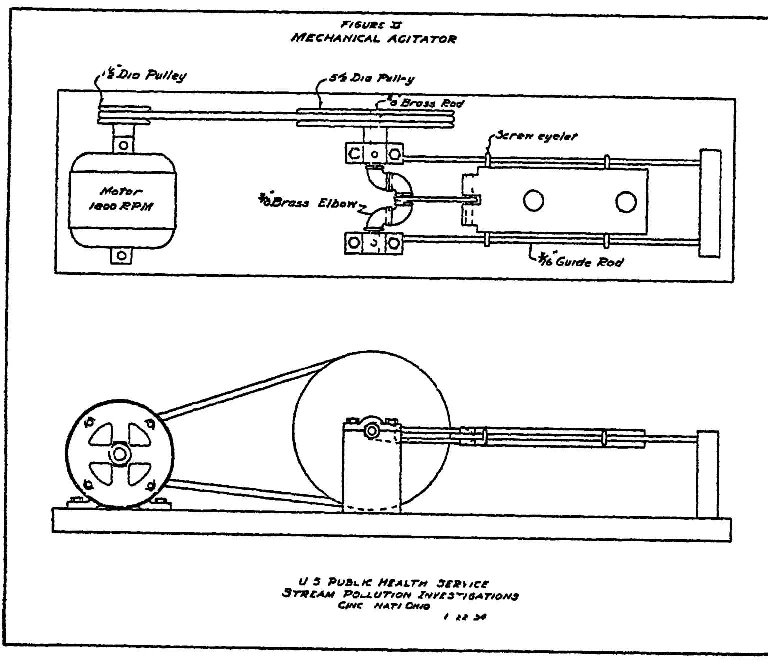
In these manipulations it is advisable to check the upward rush of the mercury by pinching the rubber tubing. It is also important that the lower stopcock be kept open when the upper stopcock is closed; otherwise a closed system is created and the gas chamber will be ruptured by any expansion of the mercury. For convenience and safety in handling, the leveling bottle should be kept in a tray suitably equipped with handles.

For a test, approximately 100 ml of sample is injected into the evacuated apparatus through the inlet tube (*E*). The volume of sample admitted to the evacuation vessel may be judged by markings on the sample bottle, or a more accurate measurement may be based on the liquid remaining after evacuation.

In tests with pure liquids, the extraction may profitably be continued for about 2 minutes, the liberation of the gases being facilitated by the gentle rotation of the evacuation vessel so as to stir the sample. With activated sludge, however, it will be advisable to extract only a fraction of the total gas, as described below. After the extraction has proceeded to the desired degree of completion, the leveling bottle is raised so as to tranfer the gases to the absorption chamber (*C*). The lower stopcock is closed when the liquid portion of the sample is about to enter the gas chamber. In field work the determination may be

interrupted at this stage and the analysis may be completed under laboratory conditions.

For the absorption of the extracted oxygen, 1 ml, or thereabouts, of the usual manganous sulphate solution (480 grams of $MnSO_4 \cdot 4H_2O$ per liter) is placed in the graduated cup (*D*) and 0.5 ml of this solution is admitted to the gas chamber (*C*) by cautiously turning the upper stopcock. The excess of reagent is voided through the outlet tube (*F*) and the cup is rinsed to remove any adhering solution. The alkaline-iodide solution (500 grams of NaOH and 150 grams of KI per liter) is then introduced in similar manner, again adding only



0 5 ml and wasting the excess of reagent. The vacuum which still exists in the gas chamber should then be broken by admitting 3 or 4 ml of distilled water of known dissolved oxygen content.

The gas analysis apparatus is next detached from the evacuation vessel and it is shaken vigorously until the absorption of the oxygen by the manganous hydroxide is complete. Manual agitation is not practical. At least 10 minutes should be allowed for the absorption, even with a mechanical agitator capable of 400 to 500 alternations per minute. A large sputum shaker of the friction-drive type has proved very satisfactory. An easily constructed agitator is shown in fig. 2.

When the absorption of the oxygen is complete, the gas analysis apparatus is again placed in position above the evacuation vessel (*A*)

and the precipitated manganese hydroxides are dissolved by introducing approximately 1 ml of 1:1 sulphuric acid through the cup (*D*). It will generally be necessary to assist the entry of the acid into the absorption chamber by the alternate application of suction or pressure to the cup (*D*) with a rubber bulb. The appearance of a reddish coloration in the acid when the upper stopcock is opened is probably due to the desiccation of manganese salts and not to the decomposition of iodides by strong acid. This coloration disappears on dilution and it does not give a blue color with starch solution. The admission of the acid to the absorption chamber may also be facilitated by the previous removal of the residual gas with suction, so as to create a vacuum in the gas chamber (*C*). This may be done by connecting the cup (*D*) and the inlet tube (*E*) with rubber tubing and creating a vacuum in the evacuation vessel (*A*). The residual gas may then be removed by suitable manipulation of the stopcocks.

The liberated iodine is then transferred to a titration vessel, adding rinsings and distilled water to bring the volume of the solution to about 100 ml. The titration is completed with thiosulphate solution and starch in the usual manner, using a 5- or 10-ml burette.

Most of the purely analytical sources of error in the Winkler method are avoided by working only with the gas. Nitrites will interfere only if acid, as from cleaning operations, is present above the mercury when the sample is introduced. Under these conditions carbon dioxide may also be liberated in amounts beyond the capacity of the 6.5-ml chamber. The iodine liberated in the final stage of the process should not come into contact with mercury which may be held in the bore of the stopcocks by excessive amounts of lubricant. Pipe-stem cleaners are convenient in avoiding this difficulty.

CALCULATIONS

Starting with 100 ml of sample, the calculations are as follows:

A=ml of 0.025 N thiosulphate solution required		$=0.75$
B=Total milligrams of oxygen	$=0.2$ A	$=0.150$
C=Correction for distilled water	$=\frac{4\times 7.50}{1000}$	$=.030$
D=Milligrams of oxygen extracted from 100 ml of sample		$=.120$
E=Apparent oxygen content (milligrams per liter)	$=10\text{D}$	$=1.20$

The correction of 0.030 milligrams is based on the assumption that the vacuum was broken with 4 ml of distilled water containing 7.50 p. p. m. of dissolved oxygen. The possibility of applying a correction for the failure to achieve 100 percent recovery of the dissolved oxygen will presently be discussed.

PRECISION OF THE METHOD

It is suggested that the precision attainable with a given piece of apparatus be determined by preliminary experiments with distilled water of known oxygen content, using different periods of evacuation and of absorption. It can then be readily shown that approximately 97 percent of the dissolved oxygen is removed when the sample is stirred under vacuum for 2 minutes, provided that an efficient system of mechanical agitation is employed for the subsequent absorption of the extracted gas. The discrepancy is due to the partial pressure of the water vapor which, at ordinary temperatures, will account for 2 or 3 percent of the total pressure. A correction for this type of error can readily be applied in dealing with nonputrescible liquids.

Having demonstrated the efficiency of the extraction and, incidentally, the adequacy of the mechanical agitation, tests should next be made to determine the percentage of recovery effected when the period of evacuation is necessarily reduced to a minimum, as in work with stale sewage or activated sludge. With the apparatus at hand, approximately 60 percent of the total dissolved oxygen is removed during the 15 seconds which are required for the injection of 100 ml of distilled water into the evacuated space plus the time devoted to 5 or 6 rapid rotations of the evacuation vessel before transferring the extracted gas to the absorption chamber.

With 97 percent recovery, an apparent oxygen content of 1.20 p. p. m. might accordingly be corrected to read $1.20/0.97=1.24$ p. p. m., although a correction of this magnitude will usually be negligible in sewage work. With a percentage recovery of only 60 percent, the corrected value becomes $1.20/0.60=2.00$ p. p. m., again assuming that the apparent oxygen content was 1.20 p. p. m. A careful examination of various possible sources of error has indicated that any discrepancy introduced by this calculation will be well within the tolerances in sewage work. Repeated tests have shown that the percentage recovery under controlled conditions is dependably constant within a variation of about 5 percent. Using partly deaerated water, it can also be shown that the percentage recovery is sensibly the same whether 2, 4, or 8 p p. m. of dissolved oxygen are present.

From the foregoing considerations it may be considered that the allowable error in tests for dissolved oxygen by the proposed procedure should not exceed 10 percent. For the purpose at hand, this degree of precision has appeared to be entirely satisfactory. Following the usual technique of working only on the supernatant liquor from the settled sludge, negative results have generally been obtained whenever the true dissolved oxygen content was 2.0 p. p. m. or less. The error in this case is absolute and is not subject even to empirical correction.

SUGGESTED APPLICATIONS

Attempts at reducing operating costs through the avoidance of wasteful amounts of air, or through its more efficient distribution, should evidently be based on accurate knowledge of what constitutes an adequate supply; otherwise the efficiency of the procedure may be impaired through false economy. Theories of "bulking" based on underaeration (or overaeration, for that matter) can never be resolved without accurate information regarding dissolved oxygen values. Systematic studies of the air requirements of the activated-sludge process, now in progress at this laboratory, have already yielded some highly interesting information and have furnished promising results. An accurate method for the determination of dissolved oxygen is likewise a prerequisite to the rational attack of other plant problems, such as the evaluation of the net usefulness of reaeration tanks, the efficient placement of air tubes or plates, the localization of anaerobic conditions, the rating of aeration devices, etc.

From a different angle it has appeared that the apparatus described in this paper might be adapted to the determination of dissolved oxygen in boiler waters and other liquids where a minor degree of reaeration during the collection of the sample may introduce a relatively huge error in the end result. Sampling difficulties should be entirely avoided by direct connection to the evacuated space. Without increasing the size of the apparatus, it should be possible to secure greater precision by combining the gas obtained from the extraction from several 100 ml portions.

ACKNOWLEDGMENTS

Acknowledgment is due to Dr. W. P. Yant, Bureau of Mines, for valuable suggestions in the design of the apparatus, and to Assistant Sanitary Engineer C. T. Wright, for the figures which accompany this paper.

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DEATHS DURING WEEK ENDED MARCH 16, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Mar. 16, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	8,741	9,016
Deaths per 1,000 population, annual basis	12.2	12.6
Deaths under 1 year of age	609	627
Deaths under 1 year of age per 1,000 estimated live births	56	58
Deaths per 1,000 population, annual basis, first 11 weeks of year	12.9	12.7
Data from industrial insurance companies:		
Policies in force	67,549,346	67,590,873
Number of death claims	14,022	16,012
Death claims per 1,000 policies in force, annual rate	10.8	12.4
Death claims per 1,000 policies, first 11 weeks of year, annual rate	10.9	11.1

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Mar. 23, 1935, and Mar. 24, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 23, 1935, and Mar. 24, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 23, 1935	Week ended Mar. 24, 1934	Week ended Mar. 23, 1935	Week ended Mar. 24, 1934	Week ended Mar. 23, 1935	Week ended Mar. 24, 1934	Week ended Mar. 23, 1935	Week ended Mar. 24, 1934
New England States:								
Maine		1	4	1	319	54	0	0
New Hampshire					8	255	1	0
Vermont	1				3	17	0	0
Massachusetts	6	15			447	2,177	4	2
Rhode Island		1			92	7	4	0
Connecticut	8	8	4	1	1,213	26	0	0
Middle Atlantic States:								
New York	38	52	[1] 17	[1] 19	2,433	1,411	15	8
New Jersey	19	30	11	24	1,300	483	2	3
Pennsylvania	53	59			5,717	2,419	6	2
East North Central States:								
Ohio	33	25	18	29	1,073	904	12	3
Indiana	19	15	42	46	410	1,525	0	3
Illinois	71	32	40	46	3,231	1,903	13	14
Michigan	13	18	6	6	3,825	141	0	0
Wisconsin	3	10	31	41	1,583	1,363	3	2
West North Central States:								
Minnesota	1	4		1	1,701	287	0	2
Iowa	12	11	15	12	1,496	291	1	3
Missouri	24	48	115	244	696	881	13	4
North Dakota	5	9			109	113	0	1
South Dakota	6	5	2	5	53	571	2	0
Nebraska	3	5	13	10	507	225	5	1
Kansas	14	7	10	4	1,694	263	1	3
South Atlantic States:								
Delaware	1	2	2		7	221	0	0
Maryland [2]	8	8	23	30	82	1,055	5	1
District of Columbia	19	9	4		77	711	12	0
Virginia	18	27			1,262	1,290	3	6
West Virginia	8	8	79	39	620	92	0	3
North Carolina	12	18	49	47	613	3,384	5	0
South Carolina	7	8	247	586	36	546	0	0
Georgia [3]	0	10	72			1,995	1	0
Florida [3]	10	7	11	3	68	243	1	0
East South Central States:								
Kentucky	11	8	100	49	1,015	636	7	1
Tennessee	9	13	135	99	75	1,157	8	2
Alabama	9	14	371	118	519	705	4	1
Mississippi [2]	8	5					1	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 23, 1935, and Mar. 24, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 23, 1935	Week ended Mar. 24, 1934	Week ended Mar. 23, 1935	Week ended Mar. 24, 1934	Week ended Mar. 23, 1935	Week ended Mar. 24, 1934	Week ended Mar. 23, 1935	Week ended Mar. 24, 1934
West South Central States:								
Arkansas	7	7	110	42	192	681	3	0
Louisiana	28	27	70	18	208	408	0	0
Oklahoma [4]	10	18	163	94	103	563	5	4
Texas [3]	48	109	949	422	131	1,461	0	6
Mountain States:								
Montana [5]	4	2			309	62	2	0
Idaho		1	6		82	179	0	0
Wyoming					169	50	0	0
Colorado [5]	3	3			352	299	0	1
New Mexico	1	5	18	3	18	42	5	1
Arizona	2	1	36	21	29	61	2	0
Utah [2]		1			14	542	0	0
Pacific States:								
Washington	1	4	5	25	203	196	1	1
Oregon	1		85	54	175	142	4	0
California	37	43	83	45	984	1,158	8	2
Total	597	713	2,955	2,193	35,373	33,230	159	80

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 23, 1935	Week ended Mar. 24, 1934	Week ended Mar. 23, 1935	Week ended Mar. 24, 1934	Week ended Mar. 23, 1935	Week ended Mar. 24, 1934	Week ended Mar. 23, 1935	Week ended Mar. 24, 1934
New England States:								
Maine	0	0	17	8	0	0	4	6
New Hampshire	0	1	18	15	0	1	0	0
Vermont	0	0	26	9	0	0	1	1
Massachusetts	0	0	255	302	0	0	2	1
Rhode Island	0	0	6	16	0	0	0	0
Connecticut	0	0	121	81	0	0	0	2
Middle Atlantic States:								
New York	0	0	1,160	947	0	0	9	6
New Jersey	1	0	163	220	0	0	2	4
Pennsylvania	0	0	756	674	0	0	7	6
East North Central States:								
Ohio	2	2	988	629	0	1	2	1
Indiana	0	0	171	244	0	1	0	12
Illinois	0	0	1,316	712	1	6	6	1
Michigan	0	0	487	913	0	3	4	9
Wisconsin	0	0	439	205	35	37	1	0
West North Central States:								
Minnesota	0	0	258	84	14	2	1	0
Iowa	0	1	102	84	2	4	5	1
Missouri	0	1	79	123	5	7	0	2
North Dakota	0	0	119	38	0	3	0	0
South Dakota	0	0	7	18	3	0	0	0
Nebraska	0	0	42	38	31	4	0	0
Kansas	0	0	52	92	29	5	0	0
South Atlantic States:								
Delaware	0	0	23	11	0	0	0	0
Maryland [3]	1	1	108	92	0	0	4	10
District of Columbia	0	0	144	15	0	0	0	0
Virginia	0	0	54	47	1	0	1	2
West Virginia	0	0	93	87	0	0	7	6
North Carolina	2	0	40	40	0	0	3	1
South Carolina	0	0	5	1	0	2	0	6
Georgia [3]	1	0	6	14	0	1	1	8
Florida [3]	0	0	1	3	0	0	1	6
East South Central States:								
Kentucky	0	0	68	33	0	0	2	1
Tennessee	0	0	20	34	0	3	1	2
Alabama	0	0	12	5	0	0	0	8
Mississippi [2]	0	0	11	4	0	2	3	4

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 23, 1935, and Mar. 24, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 23, 1935	Week ended Mar. 24, 1934	Week ended Mar. 23, 1935	Week ended Mar. 24, 1934	Week ended Mar. 23, 1935	Week ended Mar. 24, 1934	Week ended Mar. 23, 1935	Week ended Mar. 24, 1934
West South Central States:								
Arkansas	0	0	8	6	0	0	1	3
Louisiana	1	0	15	30	1	1	9	14
Oklahoma [4]	0	0	30	16	0	1	1	2
Texas [3]	1	2	74	73	24	27	9	12
Mountain States:								
Montana [5]	0	0	12	11	20	0	1	0
Idaho	0	2	4	1	0	13	2	1
Wyoming	0	0	22	8	19	0	0	0
Colorado [5]	0	0	287	20	0	4	1	0
New Mexico	0	1	14	19	2	0	2	0
Arizona	1	0	22	25	0	0	0	3
Utah [2]	0	0	141	9	0	0	0	0
Pacific States:								
Washington	0	1	50	68	20	5	0	2
Oregon	0	0	50	30	2	8	1	2
California	5	7	240	216	4	3	8	7
Total	15	19	8, 159	6, 430	216	144	97	147

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Mar. 23, 1935, 5 cases, as follows: Georgia, 2; Florida, 1; Texas, 2.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Rocky Mountain spotted fever, week ended Mar. 23, 1935, 3 cases, as follows: Montana, 2; Colorado, 1.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
February 1935										
Georgia	4	39	2, 037	128	85	47	0	54	0	11
Idaho		3	125		425		0	142	25	5
Illinois	52	213	309	7	9, 622		4	3, 983	12	24
Louisiana	4	142	171	28	401	4	3	79	3	43
Maryland	3	33	431		235		1	384		13
Michigan	7	22	103		4, 617		0	1, 464	1	9
Montana	9	11	1, 941		746		0	55	11	3
Ohio	59	307	479	1	3, 648		5	4, 037	2	20
Oklahoma [1]	17	55	1, 588	12	446	5	0	125	7	8
Oregon	1	5	779		350		1	233	17	1
Pennsylvania	27	215		1	13, 446		5	2, 598	0	40
Rhode Island	1	4	7		199		0	59	0	0
South Dakota	1	6	51		300		1	83	35	3
Texas	15	209	3, 297	575	797	25	6	324	212	73
West Virginia	7	74	1, 084		2, 079			590	1	14
Wyoming	2				462		0	36	24	1

[1] Exclusive of Oklahoma City and Tulsa.

February 1935

Disease and State		Cases
Anthrax:		
	Pennsylvania	2
	Texas	5
Botulism:		
	Maryland	2
Chicken pox:		
	Georgia	245
	Idaho	42
	Illinois	1,854
	Louisiana	46
	Maryland	666
	Michigan	1,613
	Montana	259
	Ohio	2,602
	Oklahoma [1]	112
	Oregon	324
	Pennsylvania	4,067
	Rhode Island	121
	South Dakota	110
	Texas	742
	West Virginia	253
	Wyoming	30
Conjunctivitis:		
	Georgia	3
Dengue:		
	Georgia	1
	Texas	4
Diarrhea and enteritis:		
	Maryland	11
	Ohio (under 2 years)	6
Dysentery:		
	Georgia (amoebic)	6
	Georgia (bacillary)	2
	Illinois (amoebic)	4
	Illinois (bacillary)	1
	Illinois (amoebic carriers)	18
	Louisiana (amoebic)	1
	Louisiana (bacillary)	1
	Maryland (bacillary)	3
	Michigan (amoebic)	9
	Michigan (bacillary)	2
	Ohio	1
	Pennsylvania	2
	Texas	22
Epidemic encephalitis:		
	Georgia	1
	Illinois	7
	Michigan	2
	Montana	1
	Ohio	4
	Pennsylvania	7
	Texas	2
Food poisoning:		
	Ohio	7
German measles:		
	Illinois	3,368
	Maryland	33
	Michigan	70
	Montana	4,450
	Ohio	1,214
	Pennsylvania	1,989
	Rhode Island	2
	Wyoming	114
Hookworm disease:		
	Louisiana	30
Impetigo contagiosa:		
	Illinois	4
	Maryland	8
	Montana	14
Impetigo contagiosa—Con.		
	Oklahoma [1]	1
	Oregon	34
Jaundice:		
	Maryland	2
	South Dakota	1
Lead poisoning:		
	Illinois	2
	Ohio	9
Leprosy:		
	Oklahoma [1]	1
Mumps:		
	Georgia	146
	Idaho	2
	Illinois	531
	Louisiana	4
	Maryland	63
	Michigan	551
	Montana	264
	Ohio	1,280
	Oklahoma [1]	95
	Oregon	529
	Pennsylvania	2,845
	Rhode Island	16
	South Dakota	269
	Texas	223
	West Virginia	208
	Wyoming	3
Ophthalmia neonatorum:		
	Illinois	2
	Maryland	1
	Ohio	69
	Pennsylvania	16
Paratyphoid fever:		
	Illinois	5
	Louisiana	1
	Ohio	1
	Texas	1
Puerperal septicemia:		
	Illinois	10
	Ohio	3
	Oregon	1
Rabies in animals:		
	Illinois	32
	Louisiana	26
	Oregon	1
	Rhode Island	1
Rabies in man:		
	Pennsylvania	1
Rocky Mountain spotted fever:		
	South Dakota	1
	Wyoming	1
Scabies:		
	Maryland	1
	Montana	1
	Oklahoma [1]	1
	Oregon	39
	South Dakota	1
Septic sore throat:		
	Georgia	33
	Idaho	1
	Illinois	28
	Louisiana	1
	Maryland	22
	Michigan	51
	Montana	13
	Ohio	296
	Oklahoma [1]	31
	Oregon	9
Septic sore throat—Con.		
	Rhode Island	1
	South Dakota	2
	West Virginia	4
	Wyoming	8
Tetanus:		
	Georgia	1
	Illinois	2
	Louisiana	1
Trachoma:		
	Illinois	20
	Montana	14
	Ohio	3
	Oregon	2
	Pennsylvania	1
	South Dakota	3
Trichinosis:		
	Illinois	1
	Michigan	15
	Ohio	12
	Pennsylvania	3
Tularaemia:		
	Georgia	2
	Illinois	11
	Louisiana	1
	Montana	1
	Ohio	5
	Pennsylvania	1
	Wyoming	1
Typhus fever:		
	Georgia	18
	Illinois	1
	Texas	16
Undulant fever:		
	Georgia	3
	Illinois	5
	Maryland	3
	Michigan	6
	Montana	3
	Ohio	4
	Oklahoma [1]	1
	Pennsylvania	2
	South Dakota	1
	Texas	7
Vincent's infection:		
	Illinois	31
	Maryland	5
	Michigan	30
	Montana	4
	Oregon	9
	Wyoming	1
Whooping cough:		
	Georgia	98
	Idaho	14
	Illinois	954
	Louisiana	8
	Maryland	103
	Michigan	835
	Montana	193
	Ohio	741
	Oklahoma [1]	70
	Oregon	70
	Pennsylvania	1,894
	Rhode Island	21
	South Dakota	33
	Texas	410
	West Virginia	345
	Wyoming	26

[1] Exclusive of Oklahoma City and Tulsa.

WEEKLY REPORTS FROM CITIES

City reports for week ended Mar. 16, 1935

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	1	1	0	3	2	0	0	0	3	26
New Hampshire:											
Concord	0		1	0	3	3	0	3	0	0	23
Nashua	1		0	0	0	0	0	0	0	0	
Vermont:											
Barre	0		0	0	0	0	0	0	0	0	3
Burlington	0		0	48	0	4	0	0	0	1	16
Massachusetts:											
Boston	2		1	15	27	70	0	4	1	23	236
Fall River	0		1	62	4	3	0	2	0	4	32
Springfield	0		0	134	1	16	0	0	0	18	31
Worcester	0		0	4	5	15	0	3	0	1	48
Rhode Island:											
Pawtucket	0		0	0	0	1	0	0	0	0	16
Providence	1		0	40	4	13	0	2	0	7	54
Connecticut:											
Bridgeport	1	2	0	6	3	16	0	0	0	1	18
Hartford	0		0	70	4	11	0	3	0	8	54
New Haven	0		0	278	6	0	0	1	0	0	44
New York:											
Buffalo	1		0	234	18	54	0	8	0	21	147
New York	13	12	6	938	183	621	0	72	2	286	1,550
Rochester	0	1	0	288	5	20	0	1	0	14	73
Syracuse	0		1	175	4	12	0	0	0	22	52
New Jersey:											
Camden	3		2	1	4	6	0	1	0	5	32
Newark	0	8	0	188	9	10	0	3	1	104	79
Trenton	0	1	0	47	4	11	0	1	0	2	45
Pennsylvania:											
Philadelphia	7	17	7	23	62	96	0	29	2	81	528
Pittsburgh	4	9	9	778	26	31	0	4	0	30	157
Reading	0		2	25	5	4	0	1	0	5	37
Scranton	0			302		8	0		0	1	
Ohio:											
Cincinnati	2		3	3	16	25	0	5	0	6	141
Cleveland	15	54	0	244	20	55	0	6	0	33	168
Columbus	7	1	1	85	7	38	0	4	0	1	88
Toledo	0		0	79	7	25	0	4	0	7	65
Indiana:											
Fort Wayne	0		0	14	0	3	0	0	0	1	
Indianapolis	5		1	64	14	28	0	8	1	10	
South Bend	0		0	6	3	14	0	0	0	0	21
Terre Haute	0		0	0	0	0	0	0	0	0	21
Illinois:											
Chicago	12	17	6	1,270	68	636	0	20	1	90	717
Springfield	0	3	0	7	6	7	0	0	0	2	38
Michigan:											
Detroit	9	6	6	1,265	39	173	0	19	1	84	263
Flint	2		0	620	5	11	0	0	0	4	25
Grand Rapids	0		0	79	1	5	0	2	0	0	46
Wisconsin:											
Kenosha	0		0	266	0	21	0	0	0	12	8
Madison	0		0		1	13	0	0	0	2	22
Milwuakee	1	2	2	444	6	201	0	1	0	34	105
Racine	0	1	1	42	2	4	1	1	0	17	13
Superior	0		0	432	2	0	0	0	0	0	13
Minnesota:											
Duluth	0		0	393	2	2	0	0	0	0	22
Minneapolis	1		1	943	8	85	0	2	0	13	83
St. Paul	0		0	13	10	36	0	1	0	12	56
Iowa:											
Davenport	4			0		5	0		0	0	
Des Moines	4			54		24	0		0	0	32
Sioux City	2			8		1	0		0	6	
Waterloo	1			2		7	0		0	2	

City reports for week ended Mar. 16, 1935—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Missouri:											
Kansas City	4	2	0	200	19	22	0	4	0	6	111
St. Joseph	1	------	1	4	1	0	0	4	0	0	26
St. Louis	13	------	1	23	20	24	0	14	0	8	242
North Dakota:											
Fargo	0	------	0	------	0	20	0	0	0	1	8
Grand Forks	0	------	------	------	------	1	0	------	0	1	------
South Dakota:											
Aberdeen	0	------	------	8	------	0	0	------	0	0	------
Nebraska:											
Omaha	4	------	1	37	15	10	0	3	0	0	64
Kansas:											
Topeka	------	------	------	------	------	------	------	------	------	------	------
Wichita	1	1	1	693	5	1	0	0	0	3	27
Delaware:											
Wilmington	0	------	0	6	9	15	0	0	0	0	23
Maryland:											
Baltimore	1	6	4	14	30	46	0	17	0	23	237
Cumberland	0	2	0	11	1	2	0	1	0	0	18
Frederick	0	------	0	0	0	1	0	0	0	0	4
District of Columbia:											
Washington	6	------	3	49	25	100	0	13	0	5	213
Virginia:											
Lynchburg	1	------	0	106	2	3	0	0	0	12	20
Norfolk	1	------	0	15	5	1	0	2	0	1	34
Richmond	0	------	2	158	5	2	0	0	0	0	53
Roanoke	4	------	2	52	4	1	0	0	0	0	18
West Virginia:											
Charleston	0	------	0	19	1	0	0	1	0	0	17
Huntington	0	------	------	11	------	1	0	------	0	0	------
Wheeling	0	------	0	129	2	17	0	0	0	5	19
North Carolina:											
Raleigh	3	------	0	0	2	2	0	1	0	1	16
Wilmington	0	------	0	0	1	0	0	0	0	6	7
Winston-Salem	0	------	1	10	0	2	0	0	0	30	19
South Carolina:											
Charleston	0	49	0	5	1	1	0	0	0	3	17
Columbia	0	------	0	0	3	0	0	2	0	0	21
Greenville	0	------	0	0	2	1	0	0	0	0	5
Georgia:											
Atlanta	2	36	1	0	12	1	0	3	0	2	97
Brunswick	0	1	1	0	0	0	0	0	0	0	5
Savannah	0	11	0	0	2	0	0	0	0	1	28
Florida:											
Miami	0	5	0	2	1	2	0	0	1	0	33
Tampa	1	2	2	38	0	3	0	0	1	1	20
Kentucky:											
Ashland	0	------	------	11	------	0	0	------	0	0	------
Lexington	2	------	0	31	2	0	0	1	0	5	19
Tennessee:											
Memphis	3	------	2	2	7	5	0	2	0	3	82
Nashville	0	------	1	4	9	2	0	4	0	5	53
Alabama:											
Birmingham	0	6	3	22	2	6	0	1	0	5	57
Mobile	2	6	2	1	4	0	0	0	0	0	29
Montgomery	1	------	------	39	------	0	0	------	0	1	------
Arkansas:											
Fort Smith	0	------	------	2	------	1	0	------	0	2	------
Little Rock	0	------	0	23	0	0	0	1	0	0	2
Louisiana:											
New Orleans	21	11	2	46	12	14	0	7	2	1	137
Shreveport	1	------	0	7	11	1	1	5	0	2	60
Oklahoma:											
Oklahoma City	1	------	1	0	8	1	0	1	0	0	49
Texas:											
Dallas	5	4	4	------	8	5	0	1	0	5	74
Fort Worth	2	------	1	3	10	6	0	1	0	0	51
Galveston	1	------	0	1	3	0	0	0	0	0	18
Houston	3	------	3	0	11	1	0	6	0	0	80
San Antonio	------	------	------	------	------	------	------	------	------	------	------

City reports for week ended Mar. 16, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Montana:											
Billings	4	------	0	7	0	1	0	0	0	0	16
Great Falls	0	------	0	31	0	3	0	0	0	0	9
Helena	0	------	0	56	2	0	0	0	0	3	4
Missoula	0	------	0	99	0	0	0	1	0	5	6
Idaho:											
Boise	0	------	0	4	1	2	0	0	0	0	12
Colorado:											
Denver	0	31	2	232	8	237	0	2	1	6	77
Pueblo	0	------	0	176	2	4	0	0	0	7	15
New Mexico:											
Albuquerque	1	------	0	0	4	0	0	4	1	1	18
Utah:											
Salt Lake City	0	------	0	11	1	80	0	1	0	51	35
Nevada:											
Reno	0	------	0	3	0	3	0	0	0	0	4
Washington:											
Seattle	0	------	------	42	------	11	0	------	0	2	------
Spokane	0	1	1	156	2	4	1	0	0	0	38
Tacoma	22	------	0	3	4	0	9	1	0	0	31
Oregon:											
Portland	0	------	1	114	7	13	0	6	0	0	76
Salem	0	2	------	0	------	0	0	------	0	0	------
California:											
Los Angeles	15	64	2	27	19	90	3	19	0	15	363
Sacramento	1	------	0	45	5	9	0	3	0	0	48
San Francisco	1	1	1	11	11	19	0	9	0	9	181

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts:			
Boston	1	0	0
New York:			
New York	12	4	0
Pennsylvania:			
Philadelphia	2	1	0
Pittsburgh	1	1	0
Ohio:			
Cincinnati	7	6	0
Cleveland	2	0	0
Toledo	1	0	0
Indiana:			
Indianapolis	1	2	0
Terre Haute	1	1	0
Illinois:			
Chicago	17	5	0
Springfield	2	1	0
Wisconsin:			
Milwaukee	2	0	0
Minnesota:			
Duluth	1	1	0
Iowa:			
Des Moines	1	0	0
Missouri:			
Kansas City	3	0	0
St. Joseph	3	0	0
St. Louis	3	0	0
Nebraska:			
Omaha	4	0	0

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Maryland:			
Baltimore	4	2	0
District of Columbia:			
Washington	9	6	1
Virginia:			
Lynchburg	1	0	0
Richmond	0	0	1
West Virginia:			
Wheeling	1	0	0
North Carolina:			
Raleigh	1	1	0
Georgia:			
Atlanta	1	1	0
Tennessee:			
Memphis	1	1	0
Nashville	2	1	0
Oklahoma:			
Oklahoma City	2	0	0
Texas:			
Fort Worth	0	2	0
Galveston	0	1	0
New Mexico:			
Albuquerque	1	0	0
Oregon:			
Portland	2	0	0
California:			
Los Angeles	0	0	5
Sacramento	1	0	0
San Francisco	0	1	0

Dengue: Miami, 1 case.
Epidemic encephalitis.—Cases: New York, 1; Cleveland, 1; Charleston, W. Va., 1.
Pellagra.—Cases: Baltimore, 1; Winston-Salem, 2; Charleston, S. C., 3; Savannah, 2; Los Angeles, 2.
Typhus fever.—Cases: Savannah, 1; Montgomery, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended March 9, 1935.—During the 2 weeks ended March 9, 1935, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis					2					2
Chicken pox		10	15	297	517	101	80	17	70	1,107
Diphtheria		5	2	29	11	12	10	2		71
Dysentery				3						3
Erysipelas				7	1	3	8	1	1	21
Influenza		724	28	65	315	3			342	1,477
Lethargic encephalitis				1		1				2
Measles		389	41	1,428	4,606	411	408	59	107	7,452
Mumps		37	17		431	87	2	10	21	608
Paratyphoid fever		3								3
Pneumonia		21			54			6	20	101
Poliomyelitis				2		1				3
Scarlet fever		33	13	233	215	31	25	12	49	611
Trachoma							1		2	3
Tuberculosis	2	5	15	154	104	15	4	3	32	334
Typhoid fever			1	19			5			25
Undulant fever					1					1
Whooping cough		4	40	191	243	55	99	7	95	734

Vital statistics—Third quarter 1934—Comparative.—The Bureau of Statistics of the Dominion of Canada has published the following preliminary statistics for the third quarter of 1934. The rates are computed on an annual basis. There were 20.5 live births per 1,000 population during the third quarter of 1934 and 20.7 per 1,000 population in the same quarter of 1933. The death rate was 8.5 per 1,000 population for the third quarter of 1934 and the same rate for the third quarter of 1933. The infant mortality rate for the third quarter of 1934 was 69.8 per 1,000 live births and 66.5 in the same period of 1933. The maternal death rate was 4.5 per 1,000 live births for the third quarter of 1934 and 4.4 for the same quarter of 1933.

The accompanying tables give the numbers of births, deaths, and marriages by Provinces for the third quarter of 1934, and deaths from certain causes in Canada for the third quarter of 1934, and the corresponding quarter of 1933, and by Provinces for the third quarter of 1934:

Number of births, deaths, and marriages

Province	Live births	Deaths (exclusive of still-births)	Deaths under 1 year of age	Maternal deaths	Marriages
Canada [1]	55,792	23,282	3,892	249	20,910
Prince Edward Island	539	191	20	4	153
Nova Scotia	2,882	1,304	183	12	1,049
New Brunswick	2,456	1,051	218	7	991
Quebec	19,490	7,544	1,950	90	6,399
Ontario	15,879	7,839	835	73	7,073
Manitoba	3,479	1,237	170	15	1,414
Saskatchewan	4,969	1,365	248	17	1,209
Alberta	3,693	1,231	178	20	1,222
British Columbia	2,405	1,520	90	11	1,400

[1] Exclusive of Yukon and the Northwest Territories.

Deaths from certain causes in Canada for the third quarter of 1933 and 1934 and by Provinces for the third quarter of 1934

Cause of death	Canada [1] (third quarter)		Province, third quarter 1934								
	1933	1934	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Automobile accidents	346	420	2	11	25	122	201	12	9	19	19
Cancer	2,618	2,587	18	158	111	632	982	164	167	137	218
Diarrhea and enteritis	1,392	1,605	4	31	104	982	322	49	46	43	24
Diphtheria	53	49		3	3	22	6	3	9	1	2
Diseases of arteries	1,578	1,606	14	92	50	325	769	107	87	66	96
Diseases of the heart	3,345	3,508	20	185	131	833	1,452	193	191	206	288
Homicide	41	41		1	2	5	12	4	4	7	6
Influenza	218	180	3	11	10	52	57	11	14	11	11
Measles	44	24			3	19		1	1		
Nephritis	1,214	1,230	12	63	30	510	308	65	50	33	78
Pneumonia	762	821	3	51	43	257	250	50	45	56	57
Poliomyelitis	35	41		1		9	24		3	2	2
Puerperal causes	240	240	4	12	7	90	73	15	17	20	11
Scarlet fever	19	33		3		21	3	1		2	3
Smallpox	1										
Suicide	237	245		11	7	33	89	17	29	26	33
Tuberculosis	1,668	1,404	19	96	70	560	324	88	67	58	122
Typhoid fever and paratyphoid fever	102	90	1		4	44	20	7	5	3	6
Other violent deaths	1,236	1,206	12	72	36	320	441	78	90	92	125

[1] Exclusive of Yukon and the Northwest Territories.

CEYLON

Malaria.—Information has been received, under date of February 4, 1935, regarding the increase in deaths during January, 1935, in two Provinces of Ceylon, due to the malaria epidemic.

Deaths reported in the northwestern Province during the month of January numbered 7,038, about 75 to 80 percent of which occurred among children under 14 years of age. The normal monthly number of deaths for this Province is said to be about 700. During the first 2 weeks of January 1,975 deaths were reported in Kegalla district, Sabaragamuwa Province. At least 1,473 deaths were in children.

The anxiety caused by the malaria epidemic was said to be increased by the continuous drought with the consequent drying up of streams

in many parts of the island, which, it was feared, would lead to a recrudescence of the epidemic during the spring months.

CUBA

Habana—Communicable diseases—4 weeks ended March 16, 1935.—During the 4 weeks ended March 16, 1935, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths
Diphtheria	2	1
Malaria	[1] 17	1
Tuberculosis	29	11
Typhoid fever	[1] 16	8

[1] Includes imported cases.

GREAT BRITAIN

England and Wales—Infectious diseases—Thirteen weeks ended December 29, 1934.—During the 13 weeks ended December 29, 1934, cases of certain infectious diseases were reported in England and Wales, as follows:

Disease	Cases	Disease	Cases
Diphtheria	22,639	Puerperal pyrexia	1,453
Ophthalmia neonatorum	1,068	Scarlet fever	45,708
Pneumonia	9,986	Smallpox	1
Puerperal fever	547	Typhoid fever	277

England and Wales—Vital statistics—Fourth quarter ended December 31, 1934.—During the quarter ended December 31, 1934, 142,634 live births and 114,341 deaths were registered in England and Wales. The following statistics are taken from the Quarterly Return of Births, Deaths, and Marriages, issued by the Registrar General of England and Wales. The figures are provisional.

Birth and death rates in England and Wales, quarter ended Dec. 31, 1934

Annual rates per 1,000 population:	
Live births	14.09
Stillbirths	.60
Deaths, all causes	11.20
Deaths under 1 year of age	[1] 54.00
Deaths from:	
Diarrhea and enteritis (under 2 years)	[1] 5.70
Annual rates per 1,000 population—Continued.	
Deaths from—Continued.	
Diphtheria	.12
Influenza	.11
Measles	.01
Scarlet fever	.02
Violence	.53
Whooping cough	.02

England and Wales—Vital statistics—Year 1934.—During the year 1934, 598,084 live births and 476,853 deaths were registered in England and Wales, with a live birth rate of 14.8 per 1,000 population and a death rate of 11.8 per 1,000 population. The number of stillbirths per 1,000 total births was 40, and the infant mortality was 59 per 1,000 live births.

[1] Per 1,000 live births.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Mar. 29, 1935, pp. 464-467. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Apr. 26, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Iran[1]*—Bushire—Correction.*—The report of 4 cases of cholera with 3 deaths as published on page 420 of the PUBLIC HEALTH REPORTS of March 22, 1935, at Bushire, Persia,[1] is an error. No cholera occurred at this place.

Plague

Hawaii Territory—Maui Island—Makawao District—Kahului.—On March 13, 1935, 1 plague-infected rat was reported 10 miles from the port of Kahului, Makawao District, Maui Island, Hawaii Territory.

India.—During the week ended March 9, 1935, 1 imported case of plague with 1 death was reported at Moulmein, India. During the week ended March 16, 1935, 15 cases of plague with 7 deaths were reported in the North West Frontier Province, India.

Tunisia—Tunis.—During the week ended February 23, 1935, 1 plague-infected rat was reported at Tunis, Tunisia, in the urban district other than wharves.

Smallpox

Ceylon—Galle.—During the week ended March 16, 1935, 10 cases of smallpox were reported at Galle, Ceylon.

Saudi Arabia.—For the period August 30, 1934, to December 21, 1934, a total of 105 cases of smallpox with 78 deaths were reported in cities of Saudi Arabia.

Typhus Fever

Libya—Tripolitania.—During the week ended February 9, 1935, 2 cases of typhus fever with 1 death were reported in Tripolitania, Libya.

Saudi Arabia.—For the period August 30, 1934, to December 21, 1934, 15 cases of typhus fever with 13 deaths were reported in cities of Saudi Arabia.

Yellow Fever

Brazil—Goyaz State.—During the week ended March 23, 1935, yellow fever was present in 6 localities of Goyaz State, Brazil. There were no known cases in cities or towns.

[1] The name of Persia has been changed to Iran, and the latter name will be used in the future.

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UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29, of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

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PREVALENCE OF DISEASE

// PUBLIC HEALTH REPORTS

VOL. 50 APRIL 12, 1935 NO. 15

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES [1]

February 24–March 23, 1935

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease."

Meningococcus meningitis.—During the past 20 years there have been two periods of high incidence of meningococcus meningitis in the United States, with maxima in 1918 and 1929. These peak years do not stand out as distinct epidemic periods, but are preceded by several years of gradually increasing rates and followed by other years of gradually declining rates. The cases for the whole reporting area declined from a maximum of 9,854 for the year 1929 to a minimum of 2,303 for the year 1934, each year having fewer cases than the preceding one. During the first 12 weeks of 1935, a total of 1,478 cases was reported, as compared with 762 in 1934, 1,062 in 1933, 937 in 1932, 1,865 in 1931, 3,154 in 1930, and 3,023 in 1929. For this 12-week period the 1935 cases totaled more than twice those of 1934 and amounted to nearly half the number of the high 1929 and 1930 records for the same weeks.

Considering all States, the weekly reports for the present winter have rather consistently exceeded those for the corresponding weeks of the preceding year since early in December. For the 4 weeks ended March 23, the number of cases reported this year (646) amounted to nearly three times the number for last year (225) and was higher than in the corresponding period for any year since 1931 (682).

Each geographic area reported appreciable increases for the present 4-week period. In the South Atlantic region the current incidence

[1] From the Office of Statistical Investigations, U. S. Public Health Service. The numbers of States included for the various diseases are as follows: Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 47; diphtheria, 48; scarlet fever, 48; influenza, 44 States and New York City. The District of Columbia is counted as a State in these reports. These summaries include only the 8 important communicable diseases for which the Public Health Service receives regular weekly reports from the State health officers

(121 cases) was more than four times that for this period last year, while the Middle Atlantic, West North Central, and Mountain and Pacific regions each reported more than three times last year's figures. The New England, East North Central, and South Central areas reported smaller increases, the numbers of cases for those sections being only about twice those reported last year. States in the various areas reporting a large number of cases in comparison with preceding years were Illinois, 77; New York, 61; Ohio and Missouri, 48 each; District of Columbia, 38; Tennessee, 28; Texas, South Carolina, and California, 23 each.

Meningococcus meningitis cases reported in each geographic area during recent weeks of 1934–35, with comparative data for corresponding weeks of the 3 preceding years

Year	Week ended—																
	1934				1935												
	Dec. 8	Dec. 15	Dec. 22	Dec. 29	Jan. 5	Jan. 12	Jan. 19	Jan 26	Feb. 2	Feb. 9	Feb. 16	Feb. 23	Mar. 2	Mar. 9	Mar. 16	Mar. 23	Mar. 30
Total:[1]																	
1934-35	50	43	47	62	67	70	74	96	127	104	134	160	154	174	159	159	173
1933-34	62	43	36	31	42	65	54	49	56	48	57	66	47	49	49	80	64
1932-33	45	57	62	77	98	87	101	76	85	83	75	64	110	95	96	92	89
1931-32	82	69	50	79	82	72	74	86	83	69	81	94	78	77	76	65	112
N. E. and M. Atl.:																	
1934-35	14	11	12	7	12	5	15	10	15	12	10	15	28	27	24	32	32
1933-34	16	8	9	5	7	13	12	6	11	9	11	9	5	14	8	15	8
1932-33	14	6	13	10	14	14	23	7	19	14	17	8	24	18	9	12	15
1931-32	27	21	11	12	24	22	22	23	23	16	17	27	20	16	21	13	33
E. N. C.																	
1934-35	8	3	12	21	20	18	19	22	25	24	34	37	45	32	44	28	49
1933-34	15	12	7	11	10	22	11	17	14	15	12	17	17	9	10	22	27
1932-33	14	19	19	29	36	24	25	30	21	25	20	20	29	30	36	42	32
1931-32	18	18	17	32	30	21	24	30	25	21	17	26	19	27	22	28	41
W. N. C.:																	
1934-35	6	5	7	9	6	8	3	16	23	8	27	23	22	18	28	22	22
1933-34	6	6	4	3	5	4	4	3	3	4	11	13	5	4	3	14	12
1932-33	2	10	8	10	15	16	15	7	15	8	7	9	20	12	23	8	10
1931-32	3	9	7	6	12	3	1	7	10	4	18	7	4	9	6	8	10
S. Atl																	
1934-35	5	13	1	6	10	15	15	14	23	23	15	32	23	30	32	27	30
1933-34	10	8	7	8	6	4	9	6	10	4	3	7	4	5	10	10	10
1932-33	3	8	5	10	10	10	10	11	9	18	8	8	9	6	7	4	8
1931-32	8	7	4	5	7	7	10	8	5	7	11	6	12	10	5	7	10
E. & W. S. C.:																	
1934-35	12	5	9	9	10	19	14	24	28	22	34	40	25	42	19	28	28
1933-34	8	3	6	2	10	15	11	12	9	9	15	14	9	13	15	14	4
1932-33	6	8	11	9	14	18	23	13	16	11	15	14	14	16	15	15	14
1931-32	13	7	7	14	4	9	11	9	11	11	13	18	7	5	16	2	9
M. & Pac.:[1]																	
1934-35	5	6	6	10	9	5	8	10	13	15	14	13	11	16	12	22	12
1933-34	7	6	8	3	4	7	7	5	9	7	5	6	7	4	3	5	8
1932-33	6	6	6	9	9	5	5	8	5	7	8	5	14	13	6	11	10
1931-32	13	7	4	10	5	10	6	9	9	10	5	10	16	10	6	7	9

[1] Exclusive of Nevada.

The table shows by geographic regions the number of cases reported for recent weeks in comparison with the experience of the 3 preceding years. A study of the data shows that since early in February the weekly incidence in every geographic area has not only been higher than that of last year but has been the highest in the 4 years included in the table.

Scarlet fever.—The number of cases of scarlet fever reported for the 4 weeks ended March 23 was 31,833—approximately 7,000 above the incidence for this period in each of the 6 preceding years. The current high incidence, however, did not prevail over the entire reporting area but was confined to certain sections and in some instances only to certain States within the area. The disease has been unusually prevalent in each of the East North Central States, except Indiana; and in the West North Central group, Minnesota, Nebraska, and North Dakota reported large numbers of cases. Each State in the South Atlantic group, except South Carolina, reported an excess over last year; but Maryland, with 405 cases, the District of Columbia, with 364 cases, and West Virginia, with 502 cases, raised the incidence in that area about 50 percent above that of last year. In the Mountain region Colorado reported 1,262 cases, as compared with 142 for the same period last year and 143 in 1933, and Utah reported 429 as against 26 and 53 for the years 1934 and 1933, respectively. Other States in the areas mentioned, as well as those in other areas, reported about the normal seasonal incidence.

Poliomyelitis.—For the country as a whole the number of cases (93) of poliomyelitis was considerably above the average for the season. The increase was mostly due to the incidence in California, where the disease has continued relatively high since the outbreak there almost a year ago. There were 38 cases reported in California for the current period, which was more than twice last year's figure for the same period and six times the number in 1933. In other regions the current incidence was about on a level with that of last year.

Measles.—The number of cases of measles rose from 91,667 for the 4 weeks ended February 23 to 132,261 for the current 4-week period. The number was slightly above the level for the corresponding period last year when the incidence exceeded that of 1926, a year when measles was unusually prevalent. Each geographic area reported appreciable increases over the preceding period. In relation to the preceding year the incidence in the New England and Middle Atlantic regions was 1.3 times that for the corresponding period last year; in each of the North Central areas it was more than twice last year's figure; in the South Atlantic and South Central sections it was only about 30 percent of that for last year; and the Mountain and Pacific sections reported about a 10-percent decline. In each region, however, the current incidence was the highest in recent years, excluding 1934.

Influenza.—Influenza continued to decline during the 4 weeks ended March 23, but the number of cases (19,456) was still about 75 percent in excess of that for the corresponding period in 1934 and 1933. For this period in 1932 and 1931 the cases totaled 36,361 and 25,635, respectively. Each geographic area reported a higher inci-

dence than at this time last year, and the disease is still quite prevalent in the South Central and Western regions; but the epidemiclike wave that has been in evidence for several weeks had passed its peak in all regions, and the incidence is declining rapidly.

Smallpox.—The number of cases of smallpox dropped from 883 for the preceding 4-week period to 695 for the 4 weeks ended March 23. The figure was slightly above that for the corresponding period last year. The increase, however, has not been general, but has been mostly confined to certain States; Nebraska and Kansas in the West North Central section, Wyoming in the Mountain region, and Washington in the Pacific area, have reported cases considerably above the seasonal expectancy for several weeks. For this period in 1933 and 1932 the cases totaled 810 and 1,414, respectively.

Typhoid fever.—The incidence of typhoid fever was the lowest for this period in recent years—383 cases, as compared with 508, 545, and 693, for the corresponding period in the years 1934, 1933, and 1932, respectively. Decreases from last year's figures in the various geographic areas ranged from 10 percent in the Mountain and Pacific sections to 35 percent in the South Atlantic region. The West North Central States reported about the same incidence as last year.

Diphtheria.—For the country as a whole, the incidence of diphtheria was the lowest for this period in the 7 years for which data are available. The number of cases was 2,533, as compared with approximately 2,800 for the corresponding period in 1934 and 1933 and about 4,000 in each of the 2 preceding years. Ohio and Illinois seemed mostly responsible for a 50-percent increase over last year in the West North Central area, and slight increases in certain States in the Mountain and Pacific areas put the total for those regions slightly above that of last year. Other sections reported very significant decreases.

Mortality, all causes.—The average mortality rate from all causes in large cities for the 4 weeks ended March 23, as reported by the Bureau of the Census, was 12.7 per 1,000 inhabitants (annual basis). The rate was 12.8, 11.8, and 13.5 in 1934, 1933, and 1932, respectively.

AGE INCIDENCE OF ILLNESS AND DEATH CONSIDERED IN BROAD DISEASE GROUPS[1]

Based on Records for 9,000 White Families in 18 States Visited Periodically for 12 Months, 1928–31

By SELWYN D. COLLINS, *Senior Statistician, United States Public Health Service*

CONTENTS

In recent years considerable thought has been given to the scrutinizing of two indexes of ill health, namely, the rate of mortality and the rate of sickness. One of the immediate results of the consideration of the significance of these orthodox tools of the epidemiologist was the observation, pointed out some years ago by Sydenstricker (6), that the pictures resulting from their simultaneous application to a given population were by no means identical. Another result was the recognition of the inadequacy of the rate of mortality as an index of ill health. This inadequacy has become widely known but has had no appreciable effect on current statistical practice for the obvious reason that sickness records of any useful magnitude have remained nonexistent.

The acquisition of new and more extensive data on sickness makes it possible to compare and contrast in greater detail than heretofore the pictures indicated by the two indexes. Reference is made, in particular, to the consideration of more or less specific causes of illness and death related to persons of specific ages. A previous report (1) presented the causes of illness at all ages; another (4) gave the extent of illness and mortality from all causes at specific ages, with a consideration of the diagnosis composition of the case and death loads at the various ages. The present paper continues by comparing the age curves of illness and mortality from 18 broad disease groups and includes an approximation of case fatalities at specific ages for

[1] From the Office of Statistical Investigations, U. S. Public Health Service.

This is the fifth of a series of papers on sickness and medical care in this group of families (1, 2, 3, 4). The survey of these families was organized and conducted by the committee on the costs of medical care; the tabulation was done under a cooperative arrangement between the committee and the Public Health Service. Committee publications based on the results deal primarily with costs and Public Health Service publications primarily with the incidence of illness and the extent and kind of medical care, without regard to cost. As costs are meaningless without some knowledge of the extent and nature of the service received, there is inevitably some overlapping. The committee staff, particularly Dr. I. S. Falk and Miss Margaret Klem, cooperated in the tabulation of the data.

Special thanks are due to Dr. Mary Gover, who assisted in the analysis; to Miss Lily Vanzee, who was in immediate charge of tabulating the data; to Drs. Amanda L. Stoughton and R. R. Jones, for advice and assistance in classifying the causes of sickness and death; and to other members of the statistical staff of the Public Health Service for advice and assistance in the preparation of the study.

each group; succeeding reports will consider in a similar way causes of illness and death that are more specific.

SOURCE OF THE DATA

Illness.—The data included in the present paper are the results of periodic canvasses of 8,758 white families living in 130 localities in 18 States and including 39,185 individuals. Each family was visited at intervals of 2 to 4 months for a period long enough to obtain a sickness record for 1 year. On the first call a record was made of the number of members of the household, together with data about sex, age, marital status, and communicable-disease history of each person On succeeding visits the canvasser recorded all illness that had occurred since the preceding call, with such pertinent facts about each case as the date of onset, the duration of disability and of confinement to bed, the nature of such medical service as was obtained, and the termination of the case. Thus there are available certain facts about the observed population and the illnesses suffered in the course of 12 months.[2]

Mortality—The surveyed population of nearly 40,000 persons is sufficient in number to give a fair degree of reliability to the sickness rates, but the number of deaths in a group of this size is so small that they afford little indication of the expected mortality from different causes at specific ages. These nearly 9,000 families were living in rural, urban, and metropolitan areas of 18 States; in many other respects they were found to be similar to the general white population of the United States (1). In the comparison of illness and death, mortality data from the registration States were used because of insufficient numbers of deaths within the surveyed group. That this substitution is justifiable is indicated in a preceding paper (4), where a comparison was made of the death rates in the two groups. The illness data, as previously stated, apply to a 12-month period for each household, but the total time of observation extended over about 3 years, the record for the first family beginning in February 1928 and for the last one ending in June 1931. Most of the observations, however, were made in 1929 and 1930. For this reason mortality data for the registration States for the years 1929 and 1930 are used.

DEFINITION OF AN ILLNESS AND THE CLASSIFICATION OF ITS CAUSES

Illness as here used refers to both injury and disease. What was actually included as cases, however, was necessarily influenced not only by the informant's (usually the housewife's) conception of illness but also by her memory. With visits as infrequent as 2 to 4 months, it is inevitable that many of the nondisabling illnesses would be ter-

[2] For more details on the method of collecting the data and the characteristics and geographic distribution of the surveyed population, see the first report in the series (1).

minated and forgotten before the next visit of the enumerator. However, if the record includes most of the real illnesses and excludes only the minor disorders, it may be as useful as a more complete one.

Illnesses that originated prior to the study and caused sickness during the year are included with those having their onset within the period of observation; 93 percent had their onset within and 7 percent prior to the year. The inclusion of these illnesses of prior onset is necessary to give proper representation to chronic ailments. A large proportion of the cases of such diseases as tuberculosis, cancer, diabetes, and cardiorenal affections originated prior to the study. A preceding paper shows for each diagnosis the number of cases with prior onset (1).

Considering an illness in the sense of a continuous period of sickness, one finds only 4.3 percent designated as due to more than one cause. In general the more important or more serious cause was used as primary, except where a disease like pneumonia is commonly recognized as following measles or influenza; in such cases the antecedent condition was taken as primary.[3] In the present series of papers, illness rates for all causes and for the broad disease groups are always based on sole or primary causes only, so that a continuous period of sickness is never counted as two illnesses. Later papers will consider the incidence of specific diseases such as tonsillitis, whooping cough, and cancer, and in these studies all cases with the given diagnosis will be counted, whether it was the sole, primary, or contributory cause of the illness. Whenever case rates are related to or compared with death rates, only the sole or primary causes can be used, because contributory causes are not available in the mortality data for the registration States.

The broad disease groups used in this paper are based on the International List of the Causes of Death. Although not identical with Pearl's (5) organological classification, most of the disease classes approximate slightly more detailed organ-system groups than those used by him. The following 13 of the 18 classes used are based obviously on anatomical location or the nature of the tissues affected: Respiratory, digestive, teeth and gums, nervous, eyes, ears, circulatory, skin, bones and organs of locomotion, kidney and bladder, male genital, female genital, and puerperal. The other five classes used are based on etiology or are miscellaneous: Communicable, other general, accidents, malformations and early infancy, and ill-defined diseases.

The comparison of sickness and death rates and their age curves for such broad diagnosis classes, and particularly the computation of estimated case fatalities at different ages, may seem inadvisable

[3] Further details on the method of classifying the causes of illness are included in the first report in the series (1)

because of the diverse character of diseases included in a group. For example, respiratory illnesses are predominantly the common cold, whereas respiratory deaths are largely pneumonia and tuberculosis, which enter into the total of respiratory cases in relatively small numbers. Similarly, cancer and diabetes are important in deaths from the affections designated as general diseases, but among the illnesses allocated to this rubric, rheumatism occurs much more frequently than either cancer or diabetes. On the other hand, the very breadth of the diagnosis classes insures similar classification of cases and deaths. Later papers will consider case and death rates and estimated case

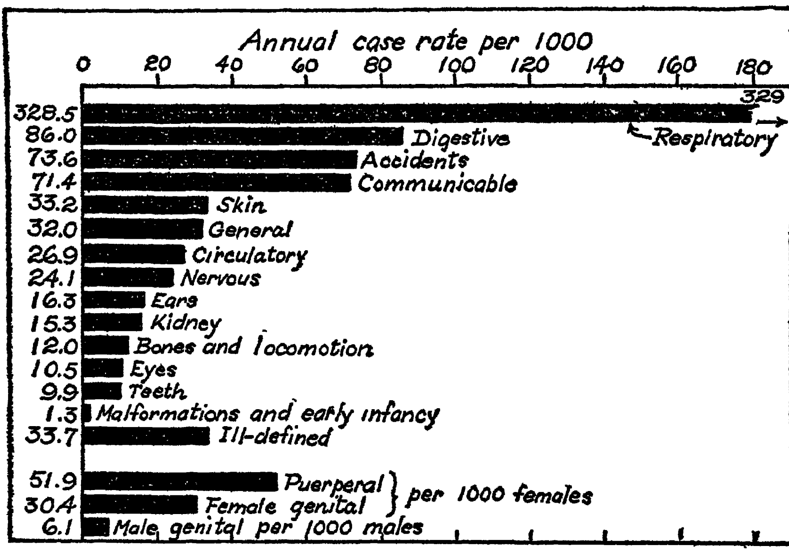

FIGURE 1.—Incidence of illness from broad disease groups among canvassed white families in 18 States during 12 consecutive months, 1928–31. (Rates adjusted to the age distribution of white persons in the registration States.)

fatalities for some of the specific diseases, such as pneumonia and appendicitis, that are important as causes of both illness and death.

ILLNESS, DEATH, AND CASE-FATALITY RATES AT ALL AGES [4]

A previous paper (4) emphasized the difference between the relative importance of the various disease groups as causes of illness and as causes of death. There is a vast difference also in the actual frequency of occurrence of the different broad causes of illness.

[4] Sickness rates shown in this paper have been adjusted to the age distribution of the white population in the registration States, so that they may be compared with mortality rates in those States. A rate so adjusted represents the rate that would obtain if the age-specific rates in the surveyed families had prevailed in a population with the age distribution of that in the registration States. This age distribution to which the rates were adjusted is shown in a preceding paper (4). The death rates in the registration States are based on the age distribution to which the case rates are adjusted, so the crude and adjusted death rates are the same.

Figure 1 shows graphically the illness rate per 1,000 persons in the surveyed population for each of the 18 disease groups. Respiratory diseases, including everything from the common cold to pneumonia and respiratory tuberculosis, are the outstanding causes of illness, constituting 40 percent of all the cases and occurring nearly four times as often as the digestive diseases, which is the next group in the order of frequency. If consideration is limited to the cases that caused loss of time from school, work, or other activities for one or more days, the respiratory diseases are also outstanding as causes of illness, occurring more than four times as frequently as communi-

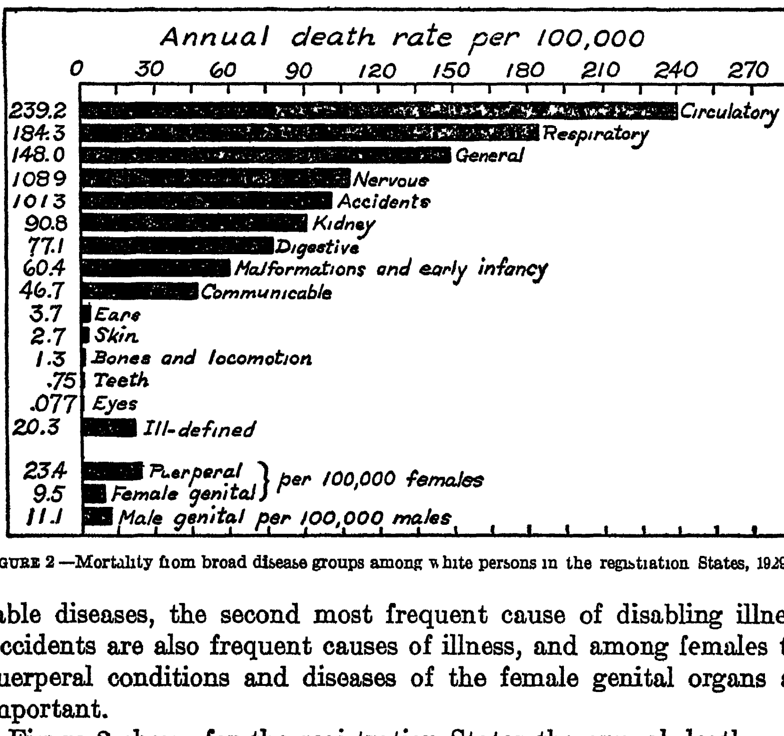

FIGURE 2.—Mortality from broad disease groups among white persons in the registration States, 1929–30

cable diseases, the second most frequent cause of disabling illness. Accidents are also frequent causes of illness, and among females the puerperal conditions and diseases of the female genital organs are important.

Figure 2 shows for the registration States the annual death rates per 100,000 for the same 18 broad disease groups, the diagnoses being arrayed according to the magnitude of the death rates. Unlike the illness picture in figure 1, there is no one organ system that overshadows all others, the circulatory being first, with respiratory as a fairly close second. General diseases (including cancer and diabetes), nervous ailments (including cerebral hemorrhage), and accidents all stand fairly high as causes of death.

The case fatality of the different disease groups may be roughly approximated by computing the ratio of the mortality rate in the registration States to the corresponding sickness rate in the surveyed

population. Figure 3 shows the estimated case fatalities computed in this way. At the top with the highest fatality stands congenital malformations and other diseases of early infancy. The recorded sickness rate for these maladies would include only such malformations and diseases as caused actual illness, and it is possible that even these were not completely recorded. It is reasonable, however, that affections of this kind should show a high fatality, since they involve children in the early months of life, when resistance is low. Next in order come the circulatory diseases, which are highly concentrated in the older ages where resistance is also at a minimum, and there is no specific remedy for degenerative maladies. The fatality is

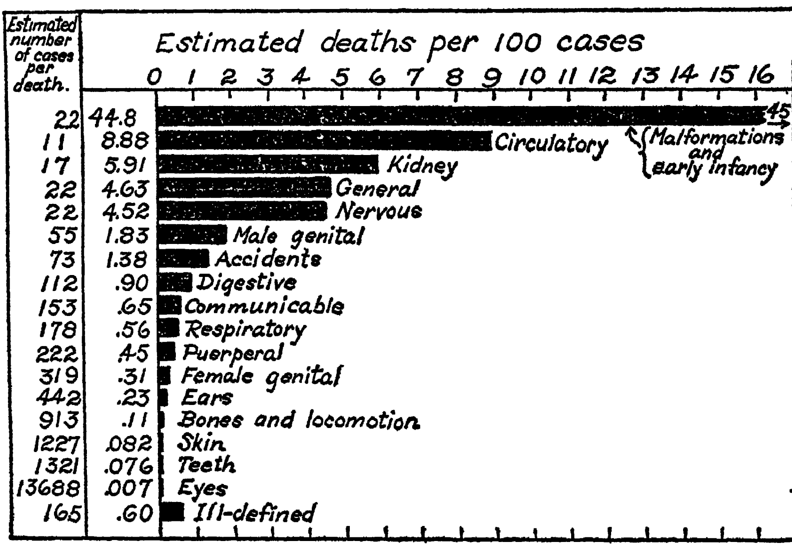

FIGURE 3.—Estimated case fatality of broad disease groups—ratio of the death rate in the registration States to the illness rate in canvassed families.

approximately the same for the next three disease groups, kidney and bladder ailments, general diseases (including cancer and diabetes), and nervous affections (including cerebral hemorrhage); the degenerative diseases of old age are an important element in all three of these groups.

The fatality in the other groups drops to a figure of less than 2 percent, the majority being well under 1 percent. At the bottom stands diseases of the skin, of the teeth, and of the eyes, where the ratio of deaths to cases is very small. The estimated fatality for all illness is 1.35 percent, or about 74 cases of illness for each death.

On the left side of the chart are figures on the reciprocal relation in the form of estimated cases of illness per death.

ILLNESS, DEATH, AND CASE-FATALITY RATES AT SPECIFIC AGES

Table 1 and figures 4, 5, 6, 7 show for each of the 18 broad disease groups the age incidence of all cases of illness, of fatal cases (deaths in the registration States), and the estimated case fatality, or ratio of the death rate to the case rate in corresponding age groups. Because of the great variation in the size of the rates for the several causes, as indicated by figures 1, 2, and 3, it is impracticable to plot the different diseases on the same scale. Each diagnosis has its own rate scale, but it is so made that an interval on it that corresponds to 20 years on the horizontal age scale is equal to the adjusted rate for all ages. Thus the curves for the disease groups are like curves plotted on a relative basis, that is, like curves of the ratio of the rate in each age to the rate for all ages. In this way the relative variability with age is comparable from one disease group to another and in addition the relative variability with age in the case rates, the death rates, and the case fatality rates are also roughly comparable. Curves for incidence, mortality, and case fatality for a given disease group are in adjacent sections of the same graph.

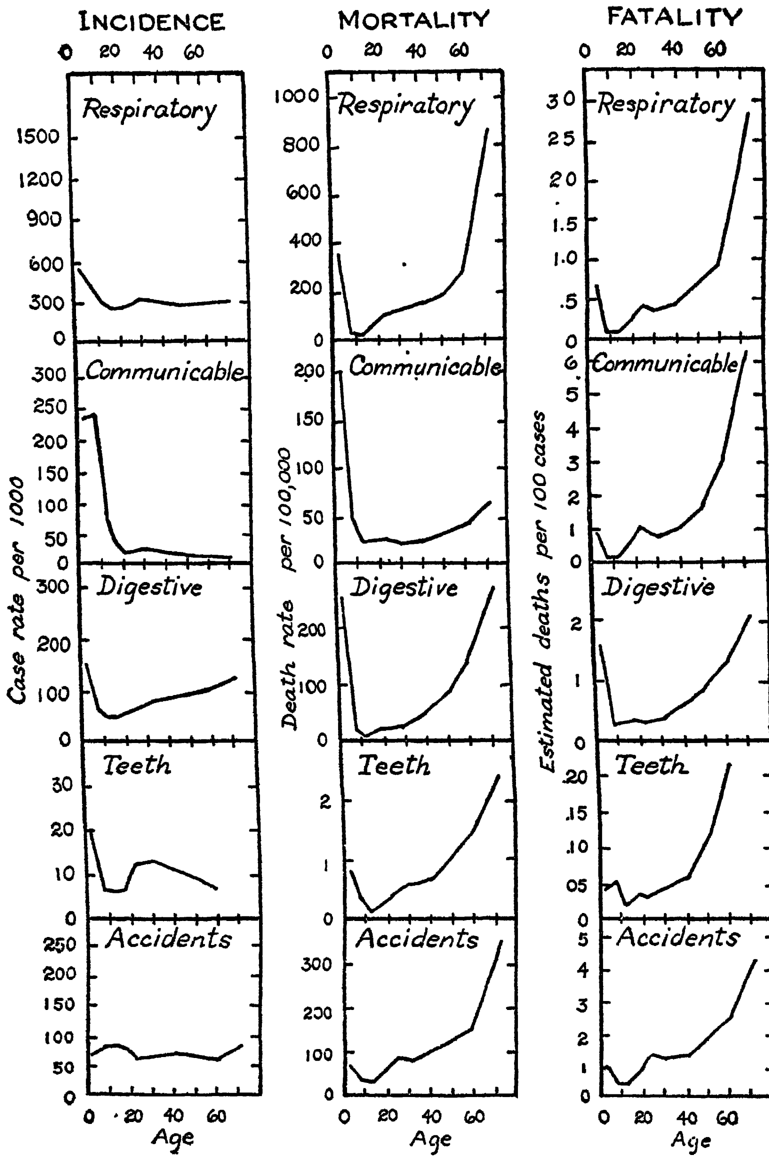

FIGURE 4.—Incidence, mortality, and estimated case fatality at specific ages for broad disease groups—illness in canvassed white families in 18 States during 12 consecutive months, 1928-31, and mortality among white persons in the registration States, 1929-30. (Scales are so made that the adjusted rate for all ages represents an interval on the vertical rate scale that corresponds to 20 years on the horizontal age scale.)

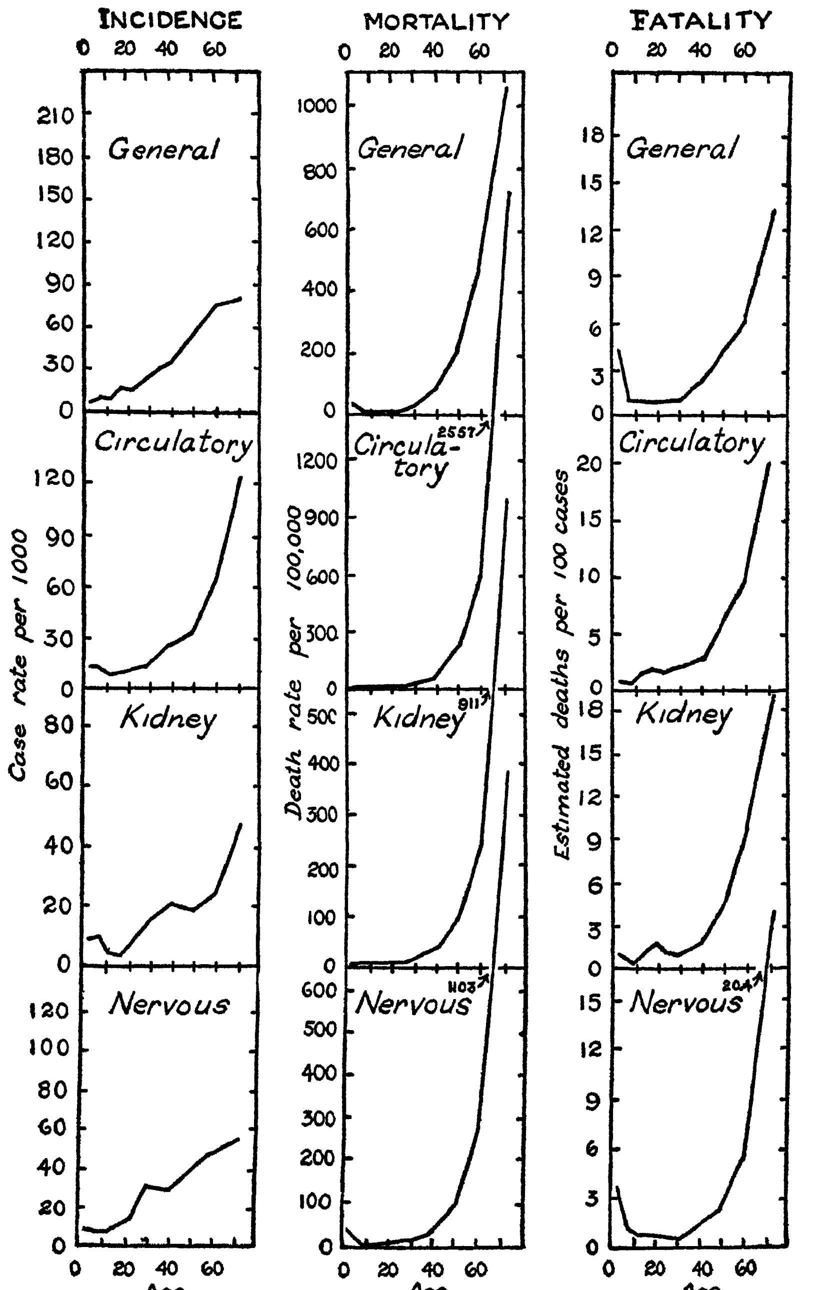

FIGURE 5.—Incidence, mortality, and estimated case fatality at specific ages for broad disease groups. (See fig 4 for source of data and details about scales.)

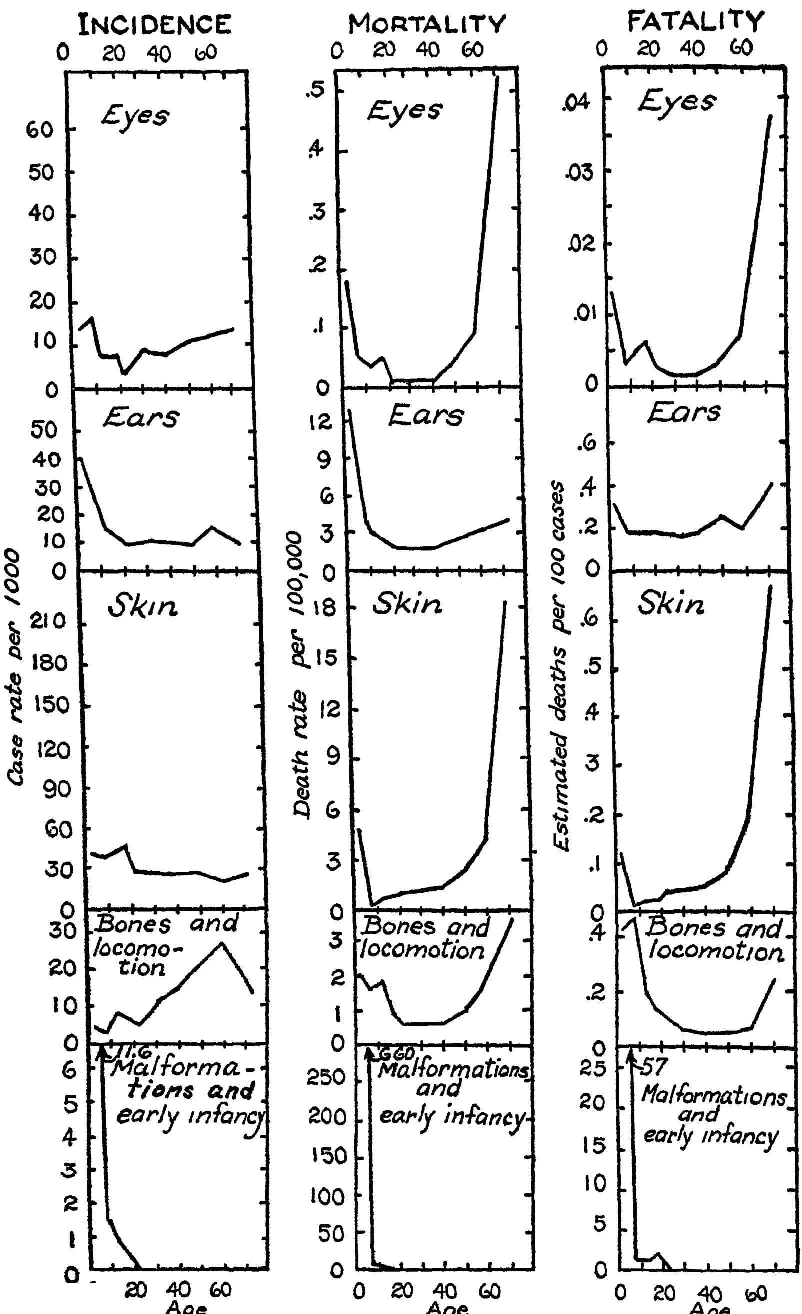

FIGURE 6.—Incidence, mortality, and estimated case fatality at specific ages for broad disease groups. (See fig. 4 for source of data and details about scales.)

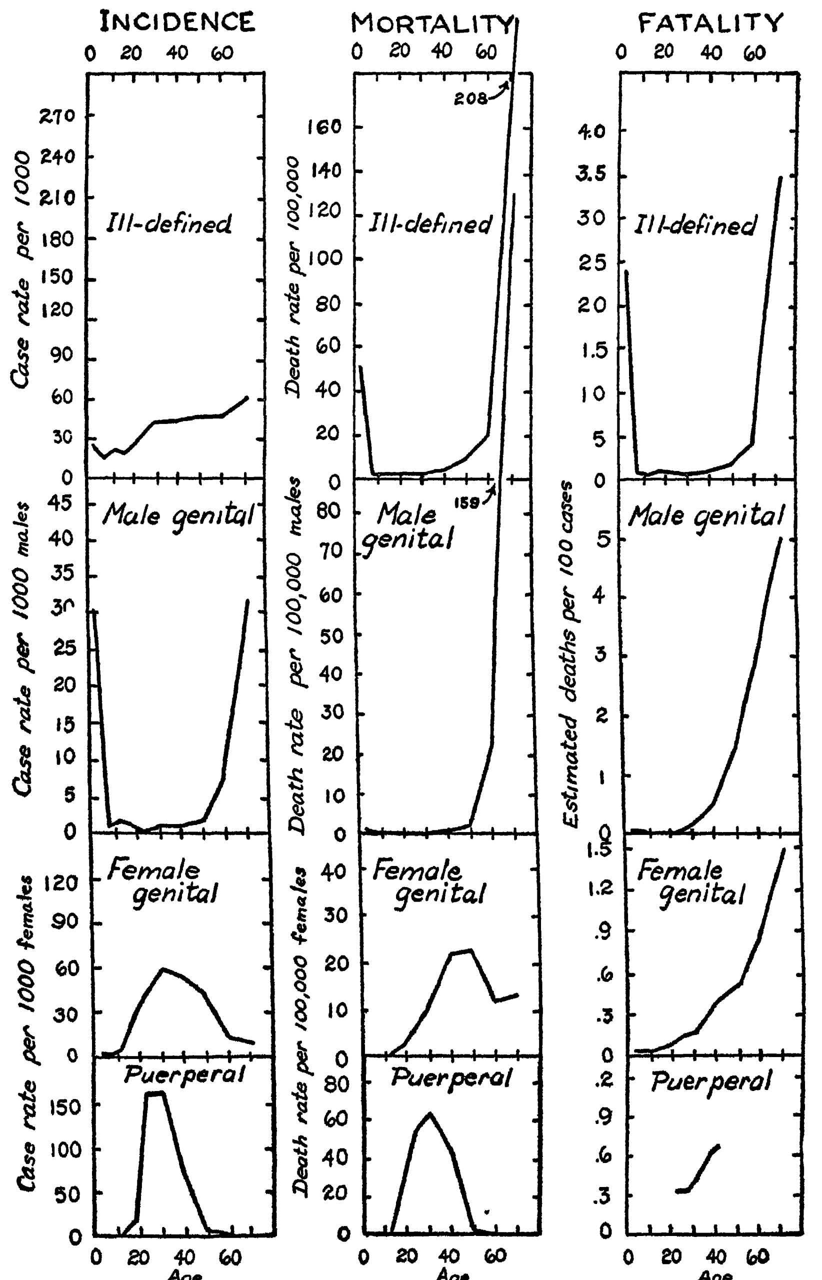

FIGURE 7.—Incidence, mortality, and estimated case fatality at specific ages for broad disease groups. (Fatality of puerperal cases is shown in 5-year age groups from 20 to 44 only; case incidence and mortality are in the usual 5- and 10-year groups shown in table 1. See fig. 4 for source of data and details about scales.)

TABLE 1.—*Age incidence of illness and of mortality from groups of diseases—illness in canvassed white families in 18 States during 12 consecutive months, 1928–31, and mortality among white persons in the registration States,* [1] *1929–30 (all illness—sole or primary causes only)*

Disease group, with the International List numbers, 1920 revision	Number of cases	All ages [2]: Crude	All ages [2]: Adjusted [3]	Age: Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
		Annual illness rates per 1,000 population in the surveyed group											
All causes	32, 756	849. 8	822. 58	1, 212. 0	977. 9	679. 3	599. 3	672. 5	820. 2	774. 4	759. 2	844. 5	979 0
Respiratory (11, 31, 97–107, 109)	13, 431	348. 5	328. 58	536. 5	424. 1	302. 5	253. 4	262. 9	317. 2	30. 25	283. 5	306. 9	302 6
Epidemic, endemic and infectious (1–42, exc. 11, 31)	3, 670	95. 2	71. 38	235. 4	241. 3	97. 2	40 0	22. 2	26. 8	21. 9	18 8	12. 9	10. 0
Other general (43–69)	1, 027	26. 6	31. 97	9. 6	11. 4	11. 8	18. 4	17. 0	28 2	36. 9	54. 3	76. 7	81. 2
Nervous system (70–84)	794	20. 6	24. 07	8. 7	6. 7	7. 7	11. 1	14. 2	30. 3	28 8	40. 0	47. 5	54. 1
Eyes and annexa (85)	427	11. 1	10. 54	14. 1	16. 8	8. 1	8. 9	3. 8	9. 7	8. 1	11. 6	12 9	14 0
Ears and mastoid process (86)	723	18. 8	16. 32	41. 2	28 3	17. 3	13. 4	9. 9	11. 2	10. 5	9 9	15 6	10. 0
Circulatory system (87–96)	826	21. 4	26. 95	14. 0	13. 3	9. 2	9. 8	11. 3	15. 1	26. 8	34. 0	61. 8	126 3
Teeth and gums (part of 108)	408	10. 6	9. 91	19. 1	7. 0	6. 6	6. 9	12. 3	13. 3	11. 1	9. 5	6. 8	
Digestive system (part of 108, 110–127)	3, 355	87. 0	86. 03	156. 4	69. 3	51. 0	54. 7	65. 1	77. 3	85. 2	93. 7	108. 6	127. 3
Kidneys and urinary system (128–134)	524	13. 6	15. 35	9. 6	10. 3	4. 8	3. 6	8. 0	15. 3	20. 7	19. 7	24. 4	48. 1
Male genital (nonvenereal) per 1,000 males (135, 136)	124	6. 6	6. 07	30. 6	1. 1	1. 7	1. 3		1. 3	1. 0	1. 6	7. 5	32. 0
Female genital (nonvenereal) per 1,000 females (137–142) [4]	558	23. 4	30. 41	2. 2	1. 4	5 7	28. 9	42. 5	59. 9	55. 2	43. 2	13. 5	8. 9
Puerperal state per 1,000 females (143–150) [4]	983	50. 1	51. 94				19. 7	161. 9	165. 5	70. 5	4. 7		
Skin and cellular tissue (151–154)	1, 341	34. 8	33. 16	42. 1	40. 9	42. 9	47. 5	27. 8	28. 0	26. 5	28 7	21. 7	27. 1
Bones and organs of locomotion (155–158)	410	10. 6	11. 96	4. 7	3. 5	9. 0	6. 9	6. 1	11. 3	15. 7	21. 8	27. 2	15. 0
Congenital malformations and early infancy (159–163)	79	2. 1	1. 35	11. 6	1. 7	. 9	. 3						
Accidents and other external (165–203)	2, 878	74. 7	73. 64	70. 7	85. 7	85. 8	80. 7	64. 2	65. 4	74 0	66. 3	65. 9	84. 2
Other and ill defined (164, 204, 205)	1, 198	31. 1	33. 65	21. 6	16. 3	20. 8	18. 7	27. 4	41. 1	42. 5	45. 1	45 5	60 1
Population (years of life)		[2] 38, 544		5, 513	5, 715	4, 568	3, 050	2, 119	5, 640	5, 930	3, 351	1, 473	998
		Annual death rates per 100,000 population in the registration States											
All causes			1, 107. 31	1, 711. 25	191. 54	146. 27	241. 46	337. 40	402. 67	607. 51	1, 104. 23	2, 308. 05	7, 510. 22
Respiratory (11, 31, 97–107, 109)			184. 29	361. 96	35. 04	24. 61	62. 02	107. 12	123. 40	147. 96	189. 29	284. 08	860. 43
Epidemic, endemic and infectious (1–42, exc. 11, 31)			46. 66	200. 15	48. 59	23. 32	25. 38	25. 04	22. 15	24. 18	31. 76	40. 45	63. 14
Other general (43–69)			147. 97	41. 11	11. 27	11. 39	14. 76	16. 90	32. 96	87. 96	221. 50	500. 03	1, 069. 20
Nervous system (70–84)			108. 88	31. 73	7. 64	6. 44	8. 63	10. 39	15. 46	37. 86	104. 60	281. 64	1, 102. 56
Eyes and annexa (85)			. 077	. 180	. 053	. 040	. 052	. 011	. 016	. 014	. 044	. 093	. 516
Ears and mastoid process (86)			3. 69	13. 12	5. 17	3. 12	2. 55	1. 79	1. 82	1. 89	2. 49	3. 27	4. 09

Circulatory system (87-96)			239.21	14.18	10.68	15.71	19.53	21.98	32.82	78.17	221.67	612.33	2,556.89
Teeth and gums (part of 108)			.75	.81	.40	.15	.26	.43	.61	.69	1.11	1.48	2.42
Digestive system (part of 108, 110-127)			77.07	248.37	21.27	17.54	20.67	23.06	30.55	51.43	85.79	141.05	266.02
Kidneys and urinary system (128-134)			90.77	9.47	3.99	4.71	6.71	9.60	16.33	38.38	92.63	237.22	911.44
Male genital (nonvenereal) per 100,000 males (135-136)			11.10	.67	.03	----	.02	.09	.17	.50	2.36	21.86	159.47
Female genital (nonvenereal) per 100,000 females (137-142) [4]			9.54	.10	.05	.28	2.22	5.62	11.04	21.89	22.64	11.85	13.50
Puerperal state per 100,000 females (143-150) [4]			23.37	----	----	.35	24.20	53.98	63.37	44.04	2.23	----	----
Skin and cellular tissue (151-154)			2.71	5.04	.35	.67	.90	1.06	1.16	1.37	2.35	4.19	18.28
Bones and organs of locomotion (155-158)			1.31	2.02	1.65	1.59	.97	.62	.64	.64	1.03	1.83	3.64
Congenital malformations and early infancy (159-163)			60.42	659.97	1.80	1.04	.65	.57	.29	.19	.11	.03	.02
Accidents and other external (165-203)			101.29	71.32	42.26	34.43	63.82	86.59	84.88	100.55	128.58	164.86	357.49
Other and ill defined (164, 204, 205)			20.34	51.42	1.34	.90	1.34	1.95	2.13	3.92	8.12	18.49	207.74
			Estimated case fatality (deaths per 100 illnesses) [5]										
All causes			1.35	1.41	0.20	0.21	0.40	0.50	0.49	0.79	1.45	2.73	7.67
Respiratory (11, 31, 97-107, 109)			.56	.67	.083	.081	.25	.41	.39	.49	.67	.93	2.84
Epidemic, endemic and infectious (1-42, ex. 11, 31)			.65	.85	.20	.24	.63	1.13	.83	1.10	1.69	3.14	6.30
Other general (43-69)			4.03	4.28	.99	.96	.80	.99	1.17	2.38	4.08	6.52	13.17
Nervous system (70-84)			4.52	3.64	1.15	.84	.77	.73	.51	1.31	2.62	5.93	20.38
Eyes and annexa (85)			.0073	.013	.0032	.0049	.0059	.0029	.0016	.0017	.0038	.0072	.037
Ears and mastoid process (86)			.23	.32	.18	.18	.19	.18	.16	.18	.25	.21	.41
Circulatory system (87-96)			8.88	1.01	.80	1.71	1.99	1.86	2.18	2.92	6.52	9.91	20.25
Teeth and gums (part of 108)			.076	.043	.057	.023	.038	.035	.046	.062	.12	.22	----
Digestive system (part of 108, 110-127)			.90	1.59	.31	.34	.33	.35	.39	.60	.92	1.30	2.09
Kidneys and urinary system (128-134)			5.91	.99	.39	.98	1.86	1.20	1.07	1.85	4.70	9.71	18.95
Male genital (nonvenereal) (135, 136)			1.83	.022	.026	----	.016	----	.14	.49	1.45	2.93	4.98
Female genital (nonvenereal) (137-142) [4]			.31	.043	.036	.049	.077	.13	.18	.40	.53	.88	1.52
Puerperal state (143-150) [4]			.45	----	----	----	(6)	.33	.38	.63	(6)	----	----
Skin and cellular tissue (151-154)			.082	.12	.0086	.016	.019	.038	.011	.052	.082	.19	.68
Bones and organs of locomotion (155-158)			.11	.43	.47	.21	.14	.10	.056	.041	.047	.067	.24
Congenital malformations and early infancy (159-163)			44.76	56.85	1.03	1.18	1.97	----	----	----	----	----	----
Accidents and other external (165-203)			1.38	1.01	.49	.40	.79	1.35	1.30	1.36	1.94	2.50	4.25
Other and ill defined (164, 204, 205)			.60	2.38	.082	.043	.072	.071	.052	.092	.18	.41	3.45

[1] Registration States included all States except Texas and South Dakota in 1929 and all except Texas in 1930.

[2] "All ages" includes a few of unknown age.

[3] Illness rates for all ages are adjusted to the age distribution of the white population of the registration States, i. e., the population on which the death rates are based, so no adjustment for age is necessary in the latter rates. The population of the registration States (years of life, 1929-30) is given for specific ages in table 1 of the preceding paper (4).

[4] Chronic results of preceding childbirths, such as laceration of the cervix and displacement of the uterus are included with diseases of the female genital organs, in conformity with the usual method of classifying deaths.

[5] Percentage that death rate in registration States is of case rate in surveyed population; for all ages the adjusted case rate is used in making the computation.

[6] Puerperal cases for women under 20 and over 45 years of age are too few to give reliable rates. The estimated case fatalities plotted in figure 7 are computed in 5-year age groups from 20 to 45 years only.

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The age curves of case incidence are rarely like those of mortality. The case incidence of respiratory affections (fig. 4), of accidents (fig. 4), and of skin disorders (fig. 6) varies relatively little with age, with practically no increase among older people. The death curves for all three of these diagnosis groups vary with age a great deal more than the case incidence, and all show definitely increasing rates in the older ages; respiratory and skin diseases also show high death rates under 5 years that have little or no counterpart in the incidence curves. Other diagnosis groups that show marked differences between the age curves of case incidence and mortality are diseases of the teeth and gums (fig. 4), of the eyes (fig. 6), of the bones and other organs of locomotion (fig. 6), and ill-defined diseases (fig. 7). In general, the case incidence of these affections varies relatively little with age and does not increase markedly in the older ages; the death rates for all of them increase sharply in the older ages, reflecting a relatively greater fatality at that period.

In the diseases of old age (fig. 5), such as the circulatory, the kidney and bladder, the general (including cancer and diabetes), and the nervous diseases (including cerebral hemorrhage), the age curves of cases and deaths are similar except for greater variability with age in the mortality rates. The more rapid rise with age in the death rates from these diseases again indicates an increased fatality in the older ages.

The age curves for cases and deaths are similar for digestive diseases (fig. 4) except for greater variability with age in the death rates; both rise as age increases after childhood and both show high rates under 5 years.

The illness and mortality curves for puerperal conditions and nonvenereal diseases of the female genital organs (fig. 7) are similar except for relatively higher death rates from female diseases at the close of and immediately following the childbearing ages. Both cases and deaths from diseases of the female genital organs are largely confined to the childbearing ages.

The incidence curve for nonvenereal disorders of the male genital organs (fig. 7) is similar to the mortality curve except for a high case rate under 5 years which marks the time of circumcision. Both case and death rates are high in the older ages.

Malformations and diseases of early infancy (fig. 6) virtually disappear after 5 years as a cause of death (largely after 1 year), but a residue of chronic cases appears in the incidence curve up to 20 years of age.

Both case and death rates for the communicable diseases (fig. 4) are exceptionally high under 10 years of age. The curves differ, however, in that the case incidence for children under 5 is about the same as for those 5 to 9 years of age; but the death rate under 5 is more than

four times the rate at 5 to 9 years, again reflecting the lack of resistance in the very young. Even these communicable diseases with the incidence largely confined to children show some rise in the death rate as age increases above 40 years, whereas the case rate actually declines to the end of the life span.

Diseases of the ear and mastoid process show a similar picture; the case incidence is practically constant after 20 years of age, but the death rate rises after 40. Unlike the communicable diseases, however, the case incidence is considerably higher under 5 than at 5 to 9 years of age

In considering the dissimilarity of the illness and mortality curves, it might be thought that the elimination of minor cases would reduce, somewhat at least, the differences noted. Age-specific rates for disabling sickness (causing loss of time from work, school, or other activities) are shown in table 2. The curves for disabling cases were plotted but are not shown in this report; they are very similar to those for all illness of corresponding diagnosis groups, although the disabling constitute only 60 percent of the total cases. The similarity of curves for disabling illnesses to the mortality curves is little greater than was true of curves for all illness. Since 84 percent of the disabling cases were in bed for one or more days, the curves for cases in bed would be about the same as those for all disabling cases.

TABLE 2.—*Age incidence of disabling[1] illness from groups of diseases—canvassed white families in 18 States during 12 consecutive months, 1928–31 (disabling illness—sole or primary causes only)*

Disease group with the International List numbers, 1920 revision	Number of cases	All ages[2]		Age									
		Crude	Adjusted[3]	Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
		Annual disabling illness rates per 1,000 population											
All causes	19,887	516.0	491.56	663.9	724.8	480.5	372.1	429.9	488.7	427.2	393.3	426.3	540.1
Respiratory (11, 31, 97–107, 109)	9,196	238.6	221.41	339.0	342.1	243.2	183.0	183.1	201.8	190.4	175.2	177.9	178.4
Epidemic, endemic, and infectious (1–42, exc. 11, 31)	2,824	73.3	55.23	144.2	212.1	87.6	32.8	14.2	21.3	16.4	13.4	10.2	6.0
Other general (43–69)	456	11.8	14.39	4.2	6.5	4.6	7.2	6.1	10.1	16.7	26.0	38.0	39.1
Nervous system (70–84)	390	10.1	11.93	5.4	3.7	4.4	5.9	6.6	12.9	12.8	19.7	21.1	36.1
Eyes and annexa (85)	157	4.1	3.55	3.5	9.8	5.0	3.6	1.4	3.0	1.7	3.6	.7	3.0
Ears and mastoid process (86)	366	9.5	7.58	20.9	21.2	9.2	8.2	4.3	3.6	3.7	2.1	1.4	2.0
Circulatory system (87–96)	424	11.0	13.99	7.8	8.8	5.7	4.9	6.1	6.9	11.5	14.3	31.9	75.2
Teeth and gums (part of 108)	107	2.8	2.53	5.4	2.3	2.4	2.3	2.8	3.4	2.2	.9	2.7	----------
Digestive system (part of 108, 110–127)	1,983	51.5	50.99	76.9	50.9	41.6	40.3	43.4	46.6	44.5	48.1	58.4	78.2
Kidneys and urinary system (128–134)	275	7.1	5.56	3.6	5.3	2.2	2.0	3.8	6.9	11.8	10.7	11.5	39.1
Male genital (nonvenereal) per 1,000 males (135, 136)	80	4.2	3.87	20.3	.4	1.7	1.3	----------	.8	----------	1.1	3.7	20.6
Female genital (nonvenereal) per 1,000 females (137–142)[4]	289	14.7	16.00	1.1	----------	3.5	14.5	23.7	28.1	29.5	25.2	7.5	7.1
Puerperal state per 1,000 females (143–150)[4]	953	48.6	50.30	----------	----------	----------	19.7	158.4	161.5	67.8	4.0	----------	----------
Skin and cellular tissue (151–154)	351	9.9	9.50	8.2	13.1	15.1	15.4	7.1	8.3	6.6	7.2	6.1	9.0
Bones and organs of locomotion (155–158)	172	4.5	5.00	1.8	1.2	3.5	2.0	3.3	4.6	7.4	9.9	10.2	6.0
Congenital malformations and early infancy (159–163)	47	1.2	.79	7.8	.4	.4	----------	----------	----------	----------	----------	----------	----------
Accidents and other external (165–203)	1,386	36.0	36.89	17.2	40.6	43.1	41.0	35.9	35.5	40.0	34.6	38.7	44.1
Other and ill defined (164, 204, 205)	401	10.4	11.01	7.1	6.8	9.9	5.9	6.6	14.5	13.2	13.7	12.2	20.0
Population (years of life)	----------	[2] 38,544	----------	5,513	5,715	4,568	3,050	2,119	5,640	5,930	3,351	1,473	998

[1] Disabling illness refers to cases that caused loss of time from work, school, or other usual activities for 1 or more days during the study year; 84 percent of all disabling cases were in bed for 1 or more days during the year.

[2] "All ages" includes a few of unknown age.

[3] Illness rates for all ages are adjusted to the age distribution of the white population of the registration States; this population (years of life, 1929–30) is given for specific ages in table 1 of the preceding paper (4).

[4] Chronic results of preceding childbirths, such as laceration of the cervix and displacement of the uterus are included with diseases of the female genital organs, in conformity with the usual method of classifying deaths.

The third section in each of these charts shows for specific ages the ratio of deaths to cases in the form of an estimated case fatality or deaths per 100 cases. Like the other age curves, the vertical rate scales are made so that the relative curves are comparable from diagnosis to diagnosis, and from case fatality to mortality and to sickness.[5]

In general, the fatality curves resemble the mortality more closely than the incidence curves. In the majority of the disease groups they reach a minimum from 5 to 15 years with a continuous rise thereafter; diseases of the bones and organs of locomotion (fig. 6), however, have a higher fatality in the younger ages than in those above 65 years. Fatality is high under 5 years in most of the diagnoses; contrary to this general rule, however, the circulatory and kidney diseases (fig. 5), the disorders of the teeth and gums (fig. 4), the male genital and the female genital affections (fig. 7) do not show high fatality rates among young children.

The incidence and mortality for diseases of the female genital organs (fig. 7) both decline after the period of childbearing, but the fatality of the cases that do occur is higher in the older ages, exhibiting a continuously rising curve. The incidence and mortality curves for puerperal conditions (fig. 7) are plotted in the same 5- and 10-year age groups used for the other diseases. For computing fatality rates, however, both the sickness and death data have been classified in 5-year groups and fatalities computed from 20 to 44 years only; the numbers of cases before and after those ages are too few in the surveyed population to use as a basis for reliable rates.[6] The fatality of puerperal conditions exhibits a continuously rising curve from 20 to 44 years, in agreement with the age curve of maternal mortality within these ages. Using births in the registration States as the basis for the computation, the fatality is also low at 15 to 19 years but is higher for the few births to mothers under 15 years of age.

With some exceptions the relative variability in the case-fatality curves is less than in the mortality but more than in the sickness curves. Thus in the degenerative diseases (fig. 5), like heart and cir-

[5] On the fatality charts, an interval equal to 20 years on the horizontal age scale is equal to a weighted mean of the age-specific fatality rates, the weights being proportional to the white population for the respective age groups in the registration States. Such a weighted mean is comparable to the mortality mean for all ages and to the adjusted mean case rate for all ages; thus all three curves are on the same relative basis. This weighted mean fatality which was used for making the fatality rate scales is not the fatality for all ages that appears in table 1; the fatality included there is the ratio of the death rate at all ages to the adjusted case rate at all ages, a figure which indicates the estimated fatality of all cases of a given disease group regardless of the ages at which the cases occurred. No age adjustment seems proper in the case fatalities because the age of attack is a typical characteristic of many of the disease groups. However, the case rate and the death rate that enter into the computation of the estimated case fatality are as they occur in populations of the same age distribution, viz, that of the registration States to which the case rate is adjusted.

[6] Puerperal cases as here used are composed of births, stillbirths, miscarriages, and abortions and also puerperal albuminuria and other disturbances of pregnancy without the loss of the fetus; chronic results of childbirth such as lacerations and displacements are not included as puerperal conditions but are classified as disorders of the female genital organs.

culatory affections, kidney ailments, nervous disorders (including cerebral hemorrhage), and the general diseases (including cancer and diabetes), the mortality curves rise more sharply in the older ages than the fatality curves.

The mortality rate for circulatory diseases varies from 11 per 100,000 at 5 to 9 years to 2,557 at 65 years and over, a maximum that is 232 times the minimum rate. The fatality curve of the same disease group varies from 0.8 percent at 5 to 9 years to 20.2 percent at 65 years and over, a maximum that is 25 times the minimum. In the case rates, the maximum for persons 65 years old and over is 14 times the minimum rate that occurs at 10 to 14 years of age.

Similarly in the general group (including cancer and diabetes), the maximum mortality rate of 1,069 at 65 years and over is nearly 100 times the minimum rate of 11 at 5 to 9 years, as compared with a ratio of maximum to minimum of 16 for case fatality rates and 8 for case incidence rates.

In the communicable diseases of childhood the death rate varies in the different ages from 22 to 200 per 100,000, a maximum under 5 years that is 9 times the minimum at 25 to 34 years. The case fatality varies from 0.2 percent at 5 to 9 years to 6.3 at 65 years and over, a maximum that is 31 times the minimum. Corresponding data for sickness show a rate of 10 for persons over 65 years and 241 per 1,000 at 5 to 9 years, a maximum that is 24 times the minimum.

SUMMARY

Records of illness were obtained on 8,758 white families in 130 localities in 18 States for a period of 12 consecutive months between February 1928 and June 1931. Each family was visited at intervals of 2 to 4 months to obtain the data.

The surveyed families include representation from nearly all geographic sections, from rural, urban, and metropolitan areas, from all income classes, and of both native- and foreign-born persons. The proportions of these various elements included are not identical with those in the population of the United States, but the variations are not generally large. In other respects also the surveyed group is not dissimilar to families in the general white population of the United States.

Mortality in the white population of the registration States for the years 1929–30 was used to supplement the sickness data. A comparison with the deaths in the canvassed families indicated that the use of the larger mortality experience was justifiable.

Diagnoses are considered in broad disease groups the majority of which represent organ systems. For all ages taken together, data are shown for case incidence, mortality, and an estimated case fatality for each of 18 disease groups (figs. 1, 2, and 3).

For the same 18 disease groups, age curves are shown for case incidence, mortality, and estimated case fatality. There is great variation from one diagnosis to another in the incidence curves, in the mortality curves, and in the fatality curves. There are also marked differences for a given disease group in the age curves of case incidence, mortality, and case fatality. Contrast rather than similarity is the rule as between the curves of case incidence and mortality. The fatality curve usually resembles the mortality more closely than the incidence curve (figs. 4, 5, 6, and 7).

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(5) PEARL, RAYMOND: The biology of death. J. B. Lippincott Co., 1922.
(6) SYDENSTRICKER, EDGAR: The prevalence of ill health. Bulletin of the New York Academy of Medicine, February 1928.

COURT DECISION ON PUBLIC HEALTH

City held liable for typhoid fever contracted from drinking water.—(Montana Supreme Court; *Safransky* v. *City of Helena*, 39 P.(2d) 644; decided Jan. 3, 1935.) An action was brought to recover damages from the city of Helena, the plaintiff alleging that he had contracted typhoid fever as a result of drinking contaminated water furnished by the city. A jury returned a verdict for the plaintiff and the judgment entered thereon was affirmed by the supreme court. The appellate court in its opinion reviewed the evidence in the case and stated that it "was ample to sustain a finding by the jury that defendant had failed to use reasonable care to see that the water which it supplied for human consumption was pure." "This", said the court, "was the duty enjoined upon the city when it undertook to furnish water to its inhabitants."

Farther along in the opinion the court spoke as follows:

It is true that in the operation and management of its sewerage system the city acts in a governmental capacity and is ordinarily not liable for errors of judgment. [Citations.] But it does not follow that it can furnish water to its inhabitants which it knew, or in the exercise of reasonable care should have

known, was polluted with sewage escaping from a defective sewer pipe, without assuming liability for damages occasioned thereby. The governmental function in caring for the sew[er]age system cannot be so completely divorced from the proprietary function of furnishing water to the people of the city as to render the city immune from liability.

The protection of the water from pollution and the correction of a condition brought about by the negligent care of a sewer main became a part of the corporate duty of the city in carrying out its proprietary function of furnishing wholesome water. [Citations.]

DEATHS DURING WEEK ENDED MARCH 23, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Mar. 23, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	9,014	8,972
Deaths per 1,000 population, annual basis	12.6	12.5
Deaths under 1 year of age	621	620
Deaths under 1 year of age per 1,000 estimated live births	57	58
Deaths per 1,000 population, annual basis, first 12 weeks of year	12.8	12.7
Data from industrial insurance companies:		
Policies in force	67,600,038	67,654,813
Number of death claims	14,055	14,905
Death claims per 1,000 policies in force, annual rate	10.8	11.5
Death claims per 1,000 policies, first 12 weeks of year, annual rate	10.9	11.1

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers.

Reports for Weeks Ended Mar. 30, 1935, and Mar. 31, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 30, 1935, and Mar. 31, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 30, 1935	Week ended Mar. 31, 1934	Week ended Mar. 30, 1935	Week ended Mar. 31, 1034	Week ended Mar. 30, 1935	Week ended Mar. 31, 1934	Week ended Mar. 30, 1935	Week ended Mar. 31, 1034
New England States:								
Maine	2		27		132	13	0	0
New Hampshire						125	0	0
Vermont	1				1	72	0	0
Massachusetts	11	15			489	2,223	1	2
Rhode Island		3			123	2	1	0
Connecticut	7	6	28	1	1,448	31	0	0
Middle Atlantic States:								
New York	28	37	[1] 18	[1] 24	2,867	1,179	23	6
New Jersey	29	22	31	9	1,471	429	2	0
Pennsylvania	36	41			5,414	3,059	5	0
East North Central States:								
Ohio	84	52	119	137	2,627	1,204	14	6
Indiana	14	19	28	28	475	855	6	1
Illinois	67	22	40	26	3,132	1,869	23	15
Michigan	9	22	6	9	5,103	146	4	1
Wisconsin	6	1	59	48	1,704	1,813	2	4
West North Central States:								
Minnesota	10	5	1	3	1,341	232	1	1
Iowa	13	6	8	17	1,302	151	1	5
Missouri	39	45	118	63	653	609	12	4
North Dakota	3		18	2	19	85	0	0
South Dakota	2	3	5	0	67	498	0	1
Nebraska	3	3		1	580	221	0	0
Kansas	13	4	23	7	1,785	411	8	1
South Atlantic States:								
Delaware		2	3		14	131	0	0
Maryland [2]	3	10	66	18	89	1,102	6	0
District of Columbia	14	9	4	1	52	596	13	1
Virginia	12	21			1,127	976	7	4
West Virginia	20	4	42	74	622	104	8	4
North Carolina [3]	10	16	86	81	271	2,886	1	1
South Carolina	8	18	235	693	32	902	0	0
Georgia [3]	4	14	124			1,444	0	0
Florida	4	6	14	6	57	476	0	0

Footnotes at end of table

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 30, 1935, and Mar. 31, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 30, 1935	Week ended Mar. 31, 1934	Week ended Mar. 30, 1935	Week ended Mar. 31, 1934	Week ended Mar. 30, 1935	Week ended Mar. 31, 1934	Week ended Mar. 30, 1935	Week ended Mar. 31, 1934
East South Central States:								
Kentucky	12	16	102	47	969	691	6	0
Tennessee	11	8	87	74	142	1,314	4	1
Alabama [3]	11	25	126	82	354	765	3	0
Mississippi [2]	8	6					0	0
West South Central States:								
Arkansas	1	3	28	57	241	388	3	0
Louisiana	28	18	34	3	90	223	1	0
Oklahoma [4]	5	13	96	66	128	680	8	1
Texas [3]	68	91	345	389	165	1,372	3	2
Mountain States:								
Montana [5]	2	2			457	24	0	0
Idaho [5]		1	3		69	109	0	1
Wyoming					58	112	0	0
Colorado	9	9			676	367	0	0
New Mexico	4	11	10	11	17	201	1	0
Arizona	1		21	12	27	18	1	0
Utah [2]				6	8	768	0	0
Pacific States:								
Washington	3	1	3	2	190	173	0	0
Oregon [5]		1	69	48	186	52	0	0
California	38	45	77	39	1,046	798	10	2
Total	653	656	2,054	2,090	37,919	32,082	173	64
First 13 weeks of year	9,445	11,154	91,311	35,199	316,204	308,237	1,652	718

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 30, 1935	Week ended Mar. 31, 1934	Week ended Mar. 30, 1935	Week ended Mar. 31, 1934	Week ended Mar. 30, 1935	Week ended Mar. 31, 1934	Week ended Mar. 30, 1935	Week ended Mar. 31, 1934
New England States:								
Maine	1	0	9	11	0	0	2	28
New Hampshire	0	1	12	18	0	0	0	0
Vermont	0	0	6	10	0	0	0	0
Massachusetts	1	1	272	266	0	0	1	0
Rhode Island	0	0	14	14	0	0	1	0
Connecticut	1	0	116	65	0	0	3	0
Middle Atlantic States:								
New York	0	0	1,309	862	0	0	7	10
New Jersey	2	0	221	185	0	0	4	0
Pennsylvania	2	0	689	622	0	0	3	4
East North Central States:								
Ohio	3	1	1,270	1,204	0	0	6	6
Indiana	1	0	161	274	1	3	3	1
Illinois	1	2	1,360	612	0	3	5	4
Michigan	1	0	448	805	0	0	1	8
Wisconsin	0	1	483	234	51	28	4	7
West North Central States:								
Minnesota	1	1	203	57	13	1	0	0
Iowa	0	0	94	62	6	6	4	1
Missouri	0	1	72	126	4	6	2	4
North Dakota	0	0	60	52	2	0	0	0
South Dakota	0	0	23	29	3	5	0	1
Nebraska	0	0	30	39	23	9	0	0
Kansas	0	0	73	58	0	1	0	0
South Atlantic States:								
Delaware	0	0	16	7	0	0	1	2
Maryland [3]	0	0	125	90	0	0	4	2
District of Columbia	0	0	118	16	0	0	0	0
Virginia	0	1	54	42	0	1	2	3
West Virginia	1	0	105	101	0	0	2	2
North Carolina [3]	0	1	31	22	0	0	3	4
South Carolina	0	0	5	5	0	8	0	4
Georgia [3]	0	0	11	19	4	1	6	6
Florida	0	0	2	2	0	0	2	3

Footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 30, 1935, and Mar. 31, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 30, 1935	Week ended Mar. 31, 1934	Week ended Mar. 30, 1935	Week ended Mar. 31, 1934	Week ended Mar. 30, 1935	Week ended Mar 31, 1934	Week ended Mar 30, 1935	Week ended Mar. 31, 1934
East South Central States:								
Kentucky	1	1	47	79	1	0	3	2
Tennessee	0	1	16	27	0	0	2	6
Alabama [3]	0	1	7	9	2	0	6	0
Mississippi [2]	0	0	14	11	1	2	10	4
West South Central States:								
Arkansas	0	0	5	5	2	0	0	1
Louisiana	1	0	5	15	0	1	18	6
Oklahoma [4]	0	0	23	26	0	2	9	4
Texas [3]	2	1	63	117	13	27	6	17
Mountain States:								
Montana [5]	0	0	9	4	0	0	1	0
Idaho [5]	0	0	2	6	0	13	0	0
Wyoming	0	0	16	14	2	2	0	0
Colorado	0	0	260	23	7	13	0	0
New Mexico	0	1	17	31	5	4	3	1
Arizona	0	0	79	17	0	1	1	1
Utah [2]	0	0	108	12	0	0	0	0
Pacific States:								
Washington	0	1	45	53	15	12	2	2
Oregon [5]	0	0	38	22	0	16	0	1
California	7	3	280	159	4	1	4	8
Total	26	19	8,495	6,530	159	161	181	148
First 13 weeks of year	335	256	92,435	78,669	2,488	1,888	1,666	1,933

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Mar. 30, 1935, 16 cases, as follows: North Carolina, 5; Georgia, 3; Alabama, 4; Texas, 4.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Rocky Mountain spotted fever, week ended Mar. 30, 1935, 5 cases, as follows: Montana, 2; Idaho, 1; Oregon, 2.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
February 1935										
Alabama	9	67	7,473	109	1,807	18	3	66	3	15
California	24	210	1,057	2	2,411	8	44	1,120	22	16
Florida	5	35	264	7	226	12	2	35	0	3
Kansas	17	50	152		4,940		1	425	26	3
New York	21	100		5	6,636		5	3,060	0	28
Puerto Rico		62	82	1,367	74		2	2	0	26
Virginia	22	72	6,166	3	3,785	8	3	231	1	32
Washington	7	13	246		685		2	226	118	9

February 1935

	Cases
Anthrax:	
New York	2
Puerto Rico	1
Botulism:	
California	3
Washington	4
Chicken pox:	
Alabama	350
California	3,112
Florida	171
Kansas	499
New York	3,096
Puerto Rico	167
Virginia	299
Washington	481
Dysentery:	
Alabama (amoebic)	2
California (amoebic)	24
California (bacillary)	9
New York (amoebic)	4
New York (bacillary)	20
Puerto Rico	32
Virginia (amoebic)	1
Washington (amoebic)	4
Dysentery and diarrhea:	
Virginia	36
Epidemic encephalitis:	
California	1
Florida	1
New York	10
Virginia	1
Washington	1
Filariasis:	
Puerto Rico	1
Food poisoning:	
California	16
German measles:	
Alabama	4
California	615
Kansas	3,218
New York	5,449
Washington	1,077

February 1935—Continued

	Cases
Granuloma, coccidioidal:	
California	9
Leprosy:	
California	3
Mumps:	
Alabama	270
California	1,057
Florida	115
Kansas	640
Puerto Rico	83
Virginia	234
Washington	348
Ophthalmia neonatorum:	
California	1
New York	6
Puerto Rico	8
Paratyphoid fever:	
California	3
Florida	1
New York	1
Puerperal septicemia:	
Puerto Rico	7
Rabies in animals:	
Alabama	95
California	60
Kansas	3
Washington	6
Rabies in man:	
Alabama	1
Scabies:	
Kansas	2
Septic sore throat:	
California	10
Kansas	5
New York	46
Virginia	7
Tetanus:	
California	5
Kansas	1
New York	3
Puerto Rico	13

February 1935—Continued

	Cases
Tetanus, infantile:	
Puerto Rico	2
Trachoma:	
California	13
Puerto Rico	1
Trichinosis:	
California	6
New York	32
Tularaemia:	
Alabama	1
New York	2
Virginia	3
Typhus fever:	
Alabama	2
Florida	4
New York	3
Undulant fever:	
Alabama	1
California	6
Florida	1
Kansas	1
New York	20
Virginia	1
Washington	7
Vincent's infection:	
Kansas	2
New York [1]	76
Washington	1
Whooping cough:	
Alabama	155
California	436
Florida	30
Kansas	256
New York	2,583
Puerto Rico	264
Virginia	516
Washington	115

[1] Exclusive of New York City.

WEEKLY REPORTS FROM CITIES

City reports for week ended Mar. 23, 1935

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0		0	3	1	2	0	1	1	2	23
New Hampshire:											
Concord	0		2	0	2	0	0	1	0	0	17
Nashua	0		0	0	0	1	0	0	0	0	
Vermont:											
Barre	0		0	3	0	0	0	0	0	6	4
Burlington	1		0	36	0	11	0	0	0	0	10
Massachusetts:											
Boston	1		0	35	27	39	0	12	0	27	259
Fall River	2		0	44	2	1	0	3	0	0	40
Springfield	0		0	207	2	18	0	0	0	5	39
Worcester	0		0	3	9	17	0	3	0	7	53
Rhode Island:											
Pawtucket	0		0	0	0	3	0	0	0	0	21
Providence	0		0	62	11	5	0	2	0	9	69
Connecticut:											
Bridgeport	0	1	0	6	3	11	0	2	0	0	38
Hartford	0		0	93	6	13	0	1	0	2	64
New Haven	0	1	0	357	6	0	0	0	0	0	49
New York:											
Buffalo	2		0	181	21	71	0	10	0	20	143
New York	33	17	8	1,145	184	703	0	83	2	275	1,659
Rochester	0		0	267	10	21	0	0	0	17	86
Syracuse	0		0	283	8	15	0	0	0	10	57

City reports for week ended Mar. 23, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
New Jersey:											
Camden	6	2	1	0	4	15	0	0	1	8	26
Newark	0	2	0	321	11	15	0	4	0	113	95
Trenton	1	1	0	28	2	12	0	1	0	1	35
Pennsylvania:											
Philadelphia	6	8	4	17	59	110	0	29	2	105	525
Pittsburgh	7	8	6	769	38	36	0	4	0	21	173
Reading	0		0	17	3	12	0	1	0	4	27
Scranton	0			240		3	0		0	2	
Ohio:											
Cincinnati	5		3	4	14	16	0	4	0	1	146
Cleveland	10	46	2	371	21	53	0	12	0	44	209
Columbus	6	3	3	149	8	46	0	3	4	4	99
Toledo	1	6	5	66	5	17	0	3	0	10	84
Indiana:											
Fort Wayne	2		0	25	1	8	0	0	0	0	23
Indianapolis	4		0	99	14	23	0	2	0	11	
South Bend	0		0	4	3	3	0	0	0	0	26
Terre Haute	0	1	1	0	0	2	0	0	0	0	29
Illinois:											
Chicago	23	7	3	1,538	56	670	0	32	0	104	697
Springfield											
Michigan:											
Detroit	6	6	4	1,777	40	214	0	22	0	86	304
Flint	1		0	475	2	6	0	0	0	2	22
Grand Rapids	0		0	176	2	12	0	1	0	11	46
Wisconsin:											
Kenosha	0		2	238	1	18	0	1	0	9	12
Madison	0		0	11	1	6	0	0	0	3	9
Milwaukee	0	1	1	426	6	152	0	4	0	59	118
Racine	0	1	0	45	1	18	1	0	0	13	15
Superior	0		0	167	0	1	0	0	0	0	4
Minnesota:											
Duluth	0		0	400	2	4	0	0	0	0	24
Minneapolis	0		3	990	3	98	0	2	1	35	105
St. Paul	0		0	10	12	50	0	1	0	12	70
Iowa:											
Davenport	1					4	0		0	0	
Des Moines	0			444		2	0		0	0	29
Sioux City	0			6		0	0		1	2	
Waterloo	3			4		11	0		0	1	
Missouri:											
Kansas City	2		0	119	8	15	0	2	0	3	115
St. Joseph	0		0	6	1	1	0	1	0	2	18
St. Louis	13		1	15	11	22	0	8	0	7	190
North Dakota:											
Fargo	0		0		1	17	0	1	0	0	19
Grand Forks	0			0		0	0		0	0	
South Dakota:											
Aberdeen	0			19		1	0		0	0	
Nebraska:											
Omaha	1		1	50	10	9	0	4	0	2	67
Kansas:											
Topeka											
Wichita	0	2	1	716	2	2	0	1	0	1	24
Delaware:											
Wilmington	0		0	6	6	9	0	0	0	0	35
Maryland:											
Baltimore	2	6	6	20	35	54	0	9	2	27	233
Cumberland	0	1	0	9	2	1	0	1	0	1	14
Frederick	0		0	0	0	0	0	0	0	0	5
District of Columbia:											
Washington	19	4	1	77	20	144	0	10	0	5	166
Virginia:											
Lynchburg	1		0	80	0	2	0	0	1	9	6
Norfolk	0	8	0	118	14	4	0	3	0	29	57
Richmond	1		1	137	10	2	0	4	0	0	64
Roanoke	4		0	28	0	1	0	0	0	2	9
West Virginia:											
Charleston											
Huntington	2			10		2	0		0	0	
Wheeling	0		0	116	0	12	0	3	0	8	19
North Carolina:											
Raleigh	0		0	8	0	0	0	0	0	4	6
Wilmington	0		0	0	2	1	0	2	0	8	10
Winston-Salem	1	1	0	2	2	2	0	1	0	22	10

City reports for week ended Mar. 23, 1935—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
South Carolina:											
Charleston	0	12	0	1	5	0	0	1	0	1	21
Columbia	-	-	-	-	-	-	-	-	-	-	-
Greenville	0	-	0	1	12	0	0	2	0	0	33
Georgia:											
Atlanta	5	18	4	0	8	5	0	3	11	0	90
Brunswick	0	1	1	0	1	0	0	0	0	0	2
Savannah	0	11	0	0	1	0	0	0	0	2	28
Florida:											
Miami	1	1	0	1	1	0	0	2	0	1	37
Tampa	2	2	2	16	1	0	0	1	0	0	32
Kentucky:											
Ashland	0	3	-	1	-	2	0	-	0	0	-
Lexington	0	-	0	25	2	1	0	2	0	1	17
Louisville	2	6	0	263	9	15	0	1	0	8	94
Tennessee:											
Memphis	1	-	5	1	20	4	0	11	0	6	108
Nashville	0	-	0	7	7	1	0	3	1	0	46
Alabama:											
Birmingham	0	9	6	29	10	3	0	8	0	2	85
Mobile	1	-	0	1	2	1	0	1	0	0	24
Montgomery	1	1	-	24	-	2	0	-	0	0	-
Arkansas:											
Fort Smith	1	-	-	5	-	0	0	-	0	0	-
Little Rock	0	-	0	53	0	2	0	0	0	5	-
Louisiana:											
New Orleans	21	2	2	76	10	11	0	12	1	1	165
Shreveport	1	-	0	5	8	0	0	2	0	0	41
Oklahoma:											
Oklahoma City	2	17	0	3	11	3	0	2	0	0	57
Tulsa	0	-	-	22	-	3	0	-	0	1	-
Texas:											
Dallas	5	3	3	-	11	6	0	1	0	7	57
Fort Worth	1	-	0	1	15	4	0	5	0	0	40
Galveston	0	-	0	1	5	0	0	0	0	0	19
Houston	17	-	2	2	12	4	0	8	1	0	73
San Antonio	0	-	0	1	9	0	0	6	1	0	67
Montana:											
Billings	2	-	0	4	0	3	0	0	0	0	8
Great Falls	0	-	0	-	4	0	0	0	0	5	11
Helena	0	-	0	38	0	1	0	0	0	1	1
Missoula	0	-	0	30	4	1	0	0	0	0	8
Idaho:											
Boise	0	-	0	0	1	0	0	0	0	0	8
Colorado:											
Denver	4	49	0	196	10	210	0	3	1	0	82
Pueblo	0	-	0	157	1	8	0	0	0	5	5
New Mexico:											
Albuquerque	0	-	0	0	3	0	0	3	0	18	23
Utah:											
Salt Lake City	0	-	2	11	6	125	0	0	0	67	43
Nevada:											
Reno	0	-	0	1	1	3	0	0	0	0	9
Washington:											
Seattle	0	-	2	39	6	12	2	6	0	3	90
Spokane	0	2	2	164	2	2	0	1	0	0	32
Tacoma	0	-	0	3	2	3	5	0	0	0	32
Oregon:											
Portland	0	-	2	114	5	10	0	4	0	0	95
Salem	0	-	-	1	-	0	0	-	0	0	-
California:											
Los Angeles	21	46	3	34	16	62	2	22	1	11	338
Sacramento	0	-	0	35	2	8	0	2	1	0	28
San Francisco	1	4	2	25	11	20	0	9	0	18	166

City reports for week ended Mar. 23, 1935—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Maryland:			
Worcester	1	0	0	Baltimore	3	1	0
Rhode Island:				Cumberland	0	1	0
Providence	4	3	0	District of Columbia:			
New York:				Washington	12	1	0
New York	13	9	0	West Virginia:			
New Jersey:				Wheeling	2	1	0
Trenton	0	0	1	Georgia:			
Pennsylvania:				Atlanta	1	0	0
Philadelphia	3	2	0	Kentucky:			
Pittsburgh	1	1	0	Louisville	1	3	0
Ohio:				Tennessee:			
Cincinnati	3	4	0	Memphis	2	2	0
Toledo	0	1	0	Nashville	0	1	0
Indiana:				Alabama:			
Terre Haute	1	0	0	Birmingham	1	1	0
Illinois:				Louisiana:			
Chicago:	10	8	0	New Orleans	0	0	1
Michigan:				Oklahoma:			
Detroit:	4	1	1	Oklahoma City	6	0	0
Wisconsin:				New Mexico:			
Milwaukee	3	3	0	Albuquerque	0	1	0
Missouri:				Oregon:			
Kansas City	3	1	0	Portland	3	4	0
St. Joseph	2	1	0	California:			
St. Louis	3	3	0	Los Angeles	0	0	3
Nebraska:				San Francisco	0	0	1
Omaha	3	3	0				

Epidemic encephalitis.—Cases: Philadelphia, 1; Pittsburgh, 1; Cleveland, 2; Huntington, W. Va., 1; Louisville, 15.

Pellagra.—Cases: Baltimore, 1; Atlanta, 1; Savannah, 3; Miami, 1; Tampa, 1; New Orleans, 1; Los Angeles, 2.

Rabies in man: Chicago, 1 death.

Typhus fever.—Cases: New York, 1; Tampa ,1. Deaths: Tampa, 1.

FOREIGN AND INSULAR

CUBA

Provinces—Notifiable diseases—4 weeks ended March 9, 1935.—During the 4 weeks ended March 9, 1935, cases of certain notifiable diseases were reported in the Provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	1			4		1	6
Chicken pox			3			7	10
Diphtheria		1	1	1	1	3	7
Hookworm disease				3			3
Leprosy				1			1
Malaria	208	20	371	962	146	1,946	3,663
Measles		9	1	23	1	1	35
Poliomyelitis			1				1
Tuberculosis	4	21	26	46	16	10	123
Typhoid fever		5	6	24	10	26	71

CZECHOSLOVAKIA

Communicable diseases—January 1935.—During the month of January 1935 certain communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	4		Paratyphoid fever	4	1
Cerebrospinal meningitis	9	4	Poliomyelitis	5	1
Chicken pox	277		Puerperal fever	41	13
Diphtheria	4,218	275	Scarlet fever	2,409	33
Dysentery	6		Trachoma	98	
Influenza	433	8	Typhoid fever	453	42
Lethargic encephalitis	2		Typhus fever	15	
Malaria	3				

DENMARK

Communicable diseases—October–December 1934.—During the months of October, November, and December 1934 cases of certain communicable diseases were reported in Denmark as follows:

Disease	October	November	December	Disease	October	November	December
Cerebrospinal meningitis	7	7	4	Paratyphoid fever	12	4	5
Chicken pox	9	23	37	Poliomyelitis	1,207	362	122
Diphtheria and croup	266	323	377	Puerperal fever	21	19	17
Epidemic encephalitis	7	6	1	Scabies	824	954	816
Erysipelas	361	325	290	Scarlet fever	809	989	592
German measles	3	4	3	Syphilis	84	82	71
Gonorrhea	978	820	671	Tetanus neonatorum	4	1	5
Influenza	5,295	4,650	4,338	Tetanus, traumatic	2		3
Malaria	5	15	7	Typhoid fever	19	4	6
Measles	501	1,255	4,373	Undulant fever (Bact. abort. Bang)	42	54	29
Mumps	278	316	336	Whooping cough	1,734	1,794	1,735
Paradysentery	90	25	15				

ITALY

Communicable diseases—4 weeks ended September 16, 1934.—During the 4 weeks ended September 16, 1934, certain communicable diseases were reported in Italy, as follows:

Disease	Au . 20-26		Aug. 27-Sept. 2		Sept. 3-9		Sept. 10-16	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	38	31	53	43	33	27	33	26
Cerebrospinal meningitis	4	4	13	12	6	6	5	5
Chicken pox	60	35	65	46	55	32	33	26
Diphtheria and croup	363	203	413	229	405	247	421	216
Dysentery	45	20	75	22	40	19	31	19
Lethargic encephalitis	1	1	1	1	3	3	1	1
Measles	482	191	499	189	479	182	396	146
Poliomyelitis	17	15	23	20	18	16	21	16
Scarlet fever	239	109	270	137	262	124	274	121
Typhoid fever	1,253	611	1,265	593	1,073	523	1,093	538

PUERTO RICO

Notifiable diseases—4 weeks ended March 23, 1935.—During the 4 weeks ended March 23, 1935, cases of certain notifiable diseases were reported in Puerto Rico, as follows:

Disease	Cases	Disease	Cases
Anthrax	1	Mumps	83
Chicken pox	108	Ophthalmia neonatorum	10
Diphtheria	48	Pellagra	5
Dysentery	12	Puerperal fever	1
Erysipelas	1	Syphilis	12
Filariasis	1	Tetanus	9
Influenza	46	Tuberculosis	814
Malaria	1,324	Typhoid fever	29
Measles	85	Whooping cough	253

YUGOSLAVIA

Communicable diseases—February 1935.—During the month of February 1935 certain communicable diseases were reported in Yugoslavia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	31	5	Paratyphoid fever	6	--
Cerebrospinal meningitis	10	5	Scarlet fever	206	1
Diphtheria and croup	559	73	Sepsis	9	3
Dysentery	19	2	Tetanus	14	8
Erysipelas	142	2	Typhoid fever	261	40
Influenza	4,625	5	Typhus fever	83	7
Measles	2,748	185			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Mar. 29, 1935, pp. 454–467. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Apr. 26, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Plague

Bolivia—Tomina Province—Chuquisaca Department.—During the months of January and February 1935, eight cases of plague were reported in Chuquisaca Department, Tomina Province, Bolivia.

Typhus Fever

On vessel—S. S. "Nosa Prince."—On March 24, 1935, one case of typhus fever was reported on the vessel S. S. *Nosa Prince* at San Francisco from Central America and Mexican ports via San Piedro, Calif.

Yellow Fever

Colombia—Intendencia of Meta—Restrepo.—During the week ended March 2, 1935, two cases of yellow fever were reported at Restrepo, Intendencia of Meta, Colombia.

Ivory Coast—Bassam (near).—During the period March 10–20, 1935, 1 case of yellow fever with 1 death was reported near Bassam, Ivory Coast

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections, 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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STUDIES ON THE ORIGIN OF A NEWLY DISCOVERED VIRUS WHICH CAUSES LYMPHOCYTIC CHORIOMENINGITIS IN EXPERIMENTAL ANIMALS

By CHARLES ARMSTRONG, *Surgeon*, and J. G. WOOLEY, *Acting Assistant Surgeon, United States Public Health Service*

In an earlier communication Armstrong and Lillie (*1*) described a previously unidentified virus which was encountered during the transmission, in monkeys, of infectious material from an individual who died at St. Louis during the 1933 encephalitis epidemic.[1]

Two additional strains of virus similar clinically, pathologically, and immunologically in experimental animals to this earlier-described virus have since been isolated at the National Institute of Health. The second strain was encountered during attempts to transmit experimental infection from the brain of an individual (A. O.) who died in Maine of a peculiar clinical type of encephalitis.

The patient, A. O, white female, 46 years of age, married, had onset of illness on September 27, 1934, with severe headache and chills. The temperature was 104.6° F., and the patient was delirious.

On September 28, the temperature was 100.° F.; the patient was mentally upset, and her neck was stiff. Spinal fluid showed increased pressure, 200 cells, mainly lymphocytes. There was no increase in globulin or sugar.

On September 29, the spinal fluid was bloody, sterile to culture.

Two blood counts made during the illness gave 18,000 W. B. C. each.

Death occurred on September 30.

The brain frozen in dry ice was received at the National Institute of Health on October 2, 1934. Transfers from the interior of the brain gave a pure culture of staphylococci and in stained sections cocci distributed throughout the brain tissue were seen by Surg. R. D. Lillie. No negri bodies were found.

[1] This virus is distinct from that isolated by Muckenfuss, Armstrong, and McCordock (*2*), and by Webster and Fite (*3*), which has been shown to be the causative agent of the St. Louis type of encephalitis.

Rabbits, guinea pigs, mice, and monkeys were inoculated intracerebrally with material from the deeper portions of the brain emulsified in saline. The majority of these inoculated animals died of purulent encephalitis. A monkey died on the eleventh day, and the pathological report by Surgeon Lillie stated that lymphocytic choriomeningitis was present. Material from the noninoculated cortex of the dead monkey when transferred to fresh monkeys resulted in symptoms suggestive of experimental lymphocytic choriomeningitis. The infection was conveyed to mice and the virus identified as similar to the original strain. There were, however, some qualitative differences; for example, this second strain appeared to be more virulent for monkeys but less so for mice than was the original strain.

The third strain was recovered from a monkey inoculated with the virus of poliomyelitis (monkey strain) of which it died. The animal, however, showed pathological lesions suggestive of choriomeningitis, and the virus was recovered through the inoculation of organ emulsions into fresh monkeys and thence to mice The recovery of this third strain indicates that the virus was present among our experimental animals and throws doubt upon the human origin of the earlier strains, although we cannot be certain that the virus may not originally have been introduced among our stock animals through inoculations with human material.

As a further check upon the spontaneous occurrence of the disease among our stock monkeys, serum-virus protection tests through the intracerebral inoculation of white mice were carried out.

PROTECTION TESTS ON MONKEY SERA

Sera from 44 monkeys which had never been experimentally inoculated with this virus were tested and no protective antibodies were demonstrable in 39 of them There were 5, however, whose sera possessed moderate to strong neutralizing properties. On the other hand, the sera of 13 animals which had recovered from a clinical attack following inoculation with the virus showed strong protective properties Thus it appears that immunity, presumably the result of spontaneous infection, was present among our monkeys (5 of 44) bled during the first 3 months of 1935. This conclusion is further supported by the fact that among 51 monkeys inoculated for the first time with a strain of our virus, by various routes, there were 3 in which no febrile or recognizable response occurred. Serum from one of these animals was later tested and found to possess highly potent antibodies. The remaining 48 of the 51 inoculated monkeys reacted with fever and symptoms, and in many instances the virus was recovered from the blood or spinal fluid or the disease was verified pathologically.

Individual white mice, likewise, were not infrequently encountered which withstood intracerebral doses of virus, a fraction of which usually killed the majority of mice in from 6 to 8 days. Whether such resistance is the result of a natural variation in the mice or of a specific immunity following spontaneous infection with the virus is not clear; however, the evidence in the case of monkeys suggests the latter alternative.

PROTECTION TESTS ON HUMAN SERA

Since the virus readily, even spontaneously, infects monkeys, since 2 of our 3 strains may have originated in human sources, and since the experimental disease in monkeys, as previously pointed out, *(1)* has marked resemblances to the human ailment designated as "lymphocytic" or "aseptic" meningitis, the search for specific antibodies in human sera is of extreme interest. Sera from 166 persons were, therefore, submitted to the protection test against one or more of our 3 strains of virus (protocol I). The sera examined were from normal persons, from those recovered from the St. Louis type of encephalitis, poliomyelitis, and other types of central nervous involvement. Among these 166 sera there were 155 in which no protective antibodies could be demonstrated, while in 8 instances questionable protective properties were indicated. Three additional human sera were encountered which gave, on repeated tests, a high degree of protection, equal to that observed in the sera of our experimentally immunized monkeys, and which are therefore of special interest.

Sample protocol I. Serum-virus protection test. Ex. 45

Sera (2 parts)	Dilution virus (1 part)	Day of death after inoculation	Number of mice that survived
Immune monkey 811	1:500	3	3
	1:3,333		4
	1:16,666		4
Nonimmune monkey 871	1:500	7, 8, 8, 8	0
	1:3,333	8, 9, 10	1
	1:16,666	10, 12	2
Immune person, L. O. P.	1:500		4
	1:3,333		4
	1:16,666	11	3
Nonimmune person, E. W.	1:500	8, 9, 9, 11	0
	1:3,333	9, 9, 9	1
	1:16,666	3	3

The serum from one of these cases (M. T.) also possessed antibodies against the Freeman strain of encephalitis virus (St. Louis type), she having suffered an attack of that disease during the Illinois outbreak of 1934.[2]

M. T., white female, age 20, single, seamstress; parents and two brothers living and well. *Past history:* Measles, chicken pox, and

[2] The writers are indebted to Dr. S. C. Crispin, of Danville, Ill., and to Dr. W. H. Tucker, assistant epidemiologist of the Illinois State Department of Health, for supplying us with the history of the case and the serum from it.

whooping cough as a child; tonsils removed 1924. No other serious illness prior to encephalitis, which began on August 29, 1934, with severe chills and headache, fever 103° F., pain in neck, nausea, vomiting, and constipation.

Physical findings: September 1, 1934, neck rigid, abdominal reflexes absent, deep reflexes slightly exaggerated, drowsy but easily aroused. Spinal fluid clear, moderately increased pressure, 62 cells, 52 percent polys., 48 percent lymphocytes. Sugar, 82 mg. No organisms seen on smear. Highest temperature 103.6° F. on fifth day of illness. Blood count on September 1 showed 15,800 W. B. C., 81 percent polys., 15 percent small lymphocytes, and 4 percent large lymphocytes. Temperature normal on eighth day. Clinical diagnosis, encephalitis.

Blood drawn on October 24, 1934, gave strong protection against strains of our virus as well as against the Freeman strain of encephalitis virus. Sera from the father, mother, and one brother collected March 1, 1935, failed to show protective antibodies, while the patient's serum collected at the same time again gave strong protection against the choriomeningitis virus.

The second individual (L. O. P.) whose serum showed the presence of potent neutralizing antibodies was an attendant at the National Institute of Health who was engaged in various work and who occasionally handled infected monkeys. Four other persons who were more constantly exposed to infected monkeys, however, showed no demonstrable protective antibodies in their sera.

L. O. P., colored, male, 38, married, was not clear as to his childhood infections. He was operated upon for appendicitis in 1919, but otherwise denies serious illness. He came to the laboratory in 1931, and his sickness record here reveals an occasional illness of a day or two, usually attributed to a headache. In January 1934 he was absent for 4 days with "grippe," and in October 1934 he had his tonsils removed. There was no history suggestive of central nervous involvement.

This case suggests that immunity may develop in the absence of recognizable central nervous system involvement, possibly the result of a subclinical infection. On the other hand, we have shown that, in exprimental animals, the virus is widely distributed throughout various organs, i. e., there is no marked neurotropism, and it is conceivable that immunity may result from systemic infection without involvement of the central nervous system.

The third serum to show the presence of potent protective antibodies against the choriomeningitis virus was from a patient (L. P.) with clinically typical lymphocytic aseptic meningitis, living in Virginia.[3]

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[3] The writers are indebted to Dr. W. A. Bloedorn, of Washington, D. C., and to Lieut. Commander P. F. Dickens, Medical Corps, U. S. Navy, for supplying us with the clinical and laboratory findings and the serum from this case.

L. P., white male adult, seen by Dr. W. A. Bloedorn on April 2, 1934, temperature 101.2° F., coryza, nausea, and vomiting; photophobia and slight lethargy, neck stiff, Kernig positive. Spinal tap gave clear to hazy fluid under slightly increased pressure. Laboratory studies by Dr. P. F. Dickens revealed 1260 lymphocytes, 4 polys., and 20 red blood cells. Kahn, Wassermann, and gold chloride tests negative. Chlorides 710 milligrams per 100 cc. Culture negative. W. B. C., 11,000; 76 percent polys. Uneventful recovery.

Blood collected for serum-virus neutralization test on March 5, 1935 (11 months after attack) gave strong protection against strains of our virus.

SUMMARY

1. The isolation of three similar strains of a newly described virus is reported.

2. Spontaneous infection among our stock monkeys has been demonstrated by the isolation of the virus from a noninoculated monkey and by the demonstration of specific antibodies in the sera of 5 out of 44 such animals.

3. The possibility that the virus may affect man is suggested, since two of our recovered strains are possibly of human origin. The ready and even spontaneous infection of monkeys with the virus, together with the fact that human sera (3 from 166) possessing potent specific antibodies for the virus have been encountered, points in the same direction.

4. As previously noted (*1*), the disease in monkeys resembles the human ailment designated as lymphocytic or aseptic meningitis, and serum collected from a person 11 months following a clinical attack of this disease gave strong protection against strains of our experimental virus. The finding of immunity in the serum of an exposed individual giving no history suggesting this disease, however, indicates that immunity may develop in the absence of central nervous symptoms.

REFERENCES

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(*2*) Muckenfuss, R. S., Armstrong, Chas., and McCordock, H. A.: Studies on the experimental transmission of encephalitis. Pub. Health Rep., *48* (1933): 1341–1343.

(*3*) Webster, L. T., and Fite, G. L.: A virus encountered in the studies of material from cases of encephalitis in St. Louis and Kansas City epidemic of 1933. Science, *78* (1933): 663–665.

INFECTIOUS ENCEPHALITIS

The United States Public Health Service has recently issued a publication[1] which comprises the reports of various investigators and presents the contribution of St. Louis to the knowledge of a comparatively new type of encephalitis. It is now generally recognized that the disease of 1933 was a distinct type of infectious encephalitis; and this report illustrates the fact that within a year or two of its recognition, an amount of information was obtained comparable to that achieved regarding poliomyelitis during several decades. This measure of success, it is believed, was due to the cooperative endeavor of workers from various official and research institutions concerned, including the health services of the city, universities, State, and Nation.

The formation of a metropolitan health council for current and prompt interchange of information regarding the epidemic was a notable feature of the handling of the situation. Epidemics generally know no sharp administrative boundaries, and this council therefore comprised the local health organizations of all neighboring Missouri and Illinois municipalities. Although the bulletin describes chiefly the historical, epidemiological, experimental, bacteriological, pathological, and clinical phases of the epidemic, a note is made of two important features which are not to be neglected: The toll of human suffering which such an epidemic causes, and the faithful care of the nurses and physicians who ministered to the sick.

The encephalitis epidemic in St. Louis in 1933 showed, in the mass, clinical differences from the better known type of encephalitis commonly called "lethargic encephalitis" or "sleeping sickness." In cases of the St. Louis encephalitis the onset was more abrupt and the fever was higher than in the disease prevalent since the World War; paralysis of the eye muscles was rare, and serious progressive after effects were notably lacking, recovery usually being prompt and complete, in contrast to the older disease In St Louis there was also more uniformly evidence of a mild meningeal disturbance. The classification of the different forms of encephalitis which come into question is given in the bulletin as follows:

I. Infectious encephalitis:
   1. Type A, or Economo or lethargic type, chiefly sporadic.
   2. Type B, chiefly epidemic.
      (a) Japanese form.
      (b) St. Louis form.
   3. Other types, possibly the Australian.

II. Post- or para-infectious encephalitis, chiefly seen following measles, smallpox, vaccinia, or chicken pox.

It is thus believed that the St. Louis disease was a new entity and led to an extensive epidemic of encephalitis for the first time on the

[1] Public Health Bulletin No. 214.

Western Hemisphere. A small outbreak, almost exactly similar, was reported by the Illinois State Department of Health in 1932 in the eastern part of Illinois and was restudied in connection with the St. Louis disease. Aside from this one prior incident, epidemics in Japan, particularly in 1924 and 1929, afford the the closest parallels to the St. Louis outbreak.

The dates of onset formed a sharp peak in the last week of August, extending their upward and downward slopes hardly more than a month on either side of this period. There were 575 cases in St. Louis city, with a population of 836,979, and 520 in St. Louis County, with a population of 244,850. The fatality rate was 22.5 percent in the city and 17.5 percent in the county. The incubation period had a possible range of from 4 to 21 days. No predisposition or immunity was detected as to sex, race, or economic status; but there was a very striking increase in the incidence of the disease with age, from 54 cases per 100,000 population under 10 years old, to 419 cases per 100,000 population 80 to 89 years old. No other known infectious disease shows such a regular progression from the lowest to the highest age groups. This peculiarity was also characteristic of the 1932 Illinois outbreak and the two large Japanese outbreaks. There was also a distinct tendency for the disease to be more fatal in the higher age groups, with a case fatality rate of 80 percent in those over 80 years old, and less than 10 percent in all under 50 years.

In addition to the St. Louis area there were 3 foci in 1933 to the east of St. Louis and 3 to the west, 2 of the former being in Illinois and the third in Louisville, Ky. Those to the west were in Columbia, Kansas City, and St. Joseph, Mo. In all places where the disease has appeared there was a notable freedom from multiple cases in the same family, or from other obvious contagion between cases. One striking feature of the epidemic was a progressive increase in the rate of incidence with distance from the older parts of the city—from 31 cases per 100,000 population in the river wards to 142 in the outlying western sections of the city, and 212 in the county.

Comparison of the relative numbers of patients using different water supplies and milk supplies readily eliminated these two factors from consideration as important vehicles for the spread of the infection. The possibility of an insect vector, particularly the mosquito, was, on the other hand, not so easily eliminated; but prolonged and repeated attempts to transmit the disease to susceptible animals by mosquitos were unavailing, and human experiments conducted at two prisons far outside the epidemic area were likewise negative.

The successful transmission of the disease to animals (monkeys and mice only out of all the different laboratory animals tried), with the consequent proof that this disease was due to a specific filterable

virus different from the viruses causing other known disease, was the most striking positive result of the work accomplished. Attempts were made to transmit the disease to monkeys from the brains in 15 fatal human cases, and in 7 of these successful transmission was obtained, the first symptoms appearing from 8 to 15 days after the first inoculation. Three of these strains of virus were also established in mice; Dr. Webster, of the Rockefeller Institute of Medical Research, was the first to inoculate mice successfully with material sent him from St. Louis. It is of great significance that mouse experiments were successful not only by inoculating the virus in the brain, but also merely by dropping it into the nostril.

The blood serum of human patients convalescent from the disease had the power of neutralizing the virus. This neutralizing power is not found in serum from other types of encephalitis (showing that this is a new disease), though studies completed since those reported in this bulletin show neutralization in a small proportion of the serum obtained from other localities and in a slightly larger proportion of serum obtained from persons in St. Louis who had no known infection with the disease. In other words, the virus was probably spread through a considerably larger proportion of the population than merely the patients who suffered with obvious attacks of the disease. When the virus has become established in mice this species is much more readily infected than monkeys, susceptibility being practically 100 percent by the nose or (in dilutions up to 1:1,000,000) by injections into the cranium. The virus at ordinary temperatures outside the body rapidly loses its power to infect.

The study of the role which streptococci might play in the causation of the disease was important. Streptococci producing green colonies were obtained rather readily from the nose and throat of encephalitis patients, also from normal people, and such streptococci produced changes in the brain when introduced into the cranium of rabbits At first sight these changes might be suggestive of the human disease, but consideration of the incubation period and the details of the symptoms and changes showed that they were really different from those found in human encephalitis and, further, the symptoms and changes caused by streptococci from encephalitis patients were similar to those caused by streptococci from normal people. Other studies with serum and the cultures also revealed no relation between these germs and the causation of the human disease.

The pathological studies were based on 63 autopsies which showed as the essential pathological process in the disease an acute nonpurulent inflammation of the central nervous system, characterized by intense congestion of the blood vessels with minute hemorrhages, inflammation both of the nervous system itself and the envel-

oping meningeal membranes with various types of mononuclear cells, and evidence of toxic degeneration in the nerve cells. The differences in the pathology of this disease from that of the old form of infectious encephalitis (Economo or Type A) are as follows:

1. The meninges show more intense infiltration with mononuclear cells than is usually found in the lethargic type.
2. The inflammatory foci are more widespread throughout the brain, often occurring in great numbers in the cerebral cortex, and are not restricted to the midbrain or basal ganglia.
3. Degenerative changes in the nerve cells are more frequent and neuronophagia is more marked.
4. The nerve cells in the nuclei of the cranial nerves, especially the oculomotor, rarely show degenerative changes.
5. There is more extensive involvement of the spinal cord.

The milder cases of the St. Louis type, however, could not be certainly differentiated from the lethargic type in pathology. The description of the pathology of the Japanese cases coincides with the severe examples of the St. Louis type.

In St. Louis the spinal fluid showed, as a rule, increased pressure and increased protein content, with a cell count somewhat elevated, 40 to 80 per cubic millimeter being the commonest range. These were chiefly lymphocytes. The spinal fluid sugar was usually below 70 mm per 100 cc. A striking difference from the older form of encephalitis with its frequent distressing sequels was the rapid and complete recovery in the vast majority of cases. With few exceptions the patients who survived the disease and had no complications were entirely well at the end of the arbitrarily fixed isolation period of 3 weeks. Practically all of the few patients who showed residual symptoms at that time had by 3 months from the onset given such remarkable evidence of improvement as to encourage the hope and belief that there was a good chance of ultimate complete recovery.

One unusual section of the report deals with public information and the reaction of the public. At no time during the period of the epidemic was there the slightest evidence of a psychological panic, and at no time did the people of the metropolitan area lose confidence in the capability and diligence of their health leaders or in the value of the scientific procedures which were being openly and frankly discussed. The readiness with which permission was granted for autopsies was an index and product of this popular interest and confidence and a most useful aid in solving the problems of the disease.

DEATHS FROM EXCESSIVE HEAT IN KANSAS, 1934 [1]

By Earle G. Brown, M. D., *Secretary, Kansas State Board of Health*

Excessive heat was reported as the cause of 291 deaths in Kansas in 1934. This total is the highest ever recorded for this cause in the State since death records have been kept. The number of deaths from excessive heat was exceeded only by deaths from automobile accidents and accidental falls in that group charged to external violence.

Deaths from excessive heat reported in Kansas for the period of 23 years are as follows:

1934	291	1926	21	1918	29
1933	30	1925	23	1917	27
1932	27	1924	11	1916	36
1931	75	1923	16	1915	3
1930	65	1922	13	1914	46
1929	12	1921	10	1913	70
1928	25	1920	11	1912	18
1927	13	1919	28		

Heat prostrations were reported in five of the months, May to September, inclusive. From the death certificates and the use of the supplemental report form, the day of occurrence of the heat prostration or heat stroke was secured in 288 of the 291 fatal cases. The first reported case occurred on May 7, and the last on September 1. Seven fatal heat strokes were charged to June, 159 to July, and 118 to August. The highest number for any one day, 26, was reported on July 20, and the second highest, 20, on August 10.

Certain data pertaining to daily maximum and minimum temperatures and the day of the heat strokes for June, July, and August are shown in figure 1. The maximum and minimum temperatures are the average of 24 stations located in various sections of the State, and as recorded in the Kansas Section of Climatological Data for June to September, inclusive. According to S. D. Flora, meteorologist, Topeka, these averages may be considered as the State average. Both maximum and minimum temperatures follow a similar curve.

Referring to figure 1, it will be noted that on July 10 the maximum temperature rose to 106° F., dropped 2 degrees the following day, increased to 106° on July 12, and then equaled or exceeded this temperature for a period of 9 successive days. Twelve fatal heat strokes were recorded on July 17, 15 on July 19, 26 on July 20, and 18 on July 21. A second high peak was reached on August 9. In both months the high number of fatal heat strokes occurred following a

[1] For further information regarding excessive mortality in the drought-heat area during the summer of 1934, the reader is referred to the article "Maximum Temperatures and Increased Death Rates in the Drought Area", by Selwyn D Collins and Mary Gover, published in the Public Health Reports for Aug. 31, 1934, pp. 1015–1018 (Reprint no. 1645.)—Ed.

number of days of exceptionally high temperatures. A record of the humidity rate for the State as a whole is not available, but the relative humidities undoubtedly were abnormally low.

Classifying the heat deaths into three groups, 249 were placed in the home group, 15 were the result of heat strokes in public places, and 27 were classed as industrial.

In the home group, 16 deaths occurred in children under 5 years, 14 of which were in babies under 1 year. One hundred and eighty-three deaths, or 73 percent, were in persons 65 years or over.

In the industrial group, 15 were reported as having originated in agriculture—5 in wheat fields, 4 in cornfields, 2 in hayfields, 2 in

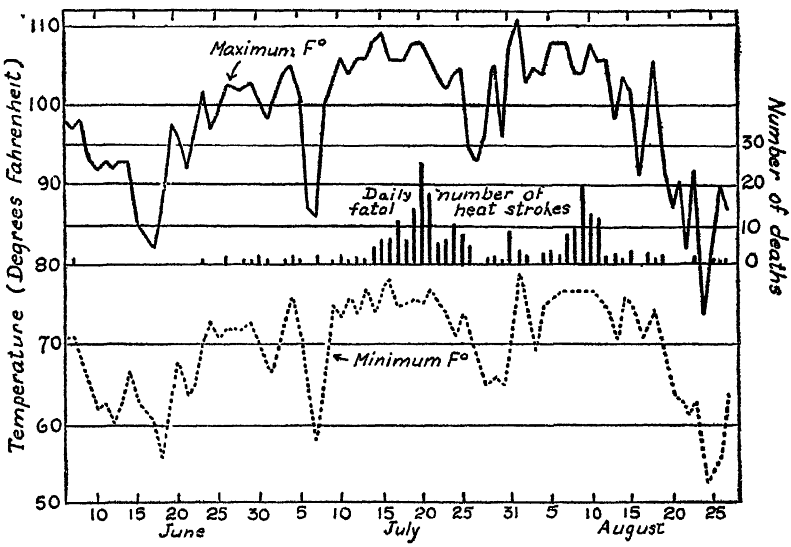

FIGURE 1. Daily maximum and minimum temperatures and daily number of fatal heat strokes reported in Kansas for June, July, and August, 1934.

pastures or fields while herding cattle, 1 while digging a well, and 1 while working on a silo.

Data pertaining to the classification of heat deaths by age groups and place of attack are presented in table 1.

TABLE 1.—*Deaths from excessive heat, by age and place of stroke*

Place	Age										
	All ages	0–4	5–9	10–14	15–24	25–29	30–39	40–49	50–59	60–64	65 and over
Total	291	16	2	3	3	3	11	20	29	21	183
Home	249	16	2	2	0	2	6	14	17	17	173
Public place [1]	15	0	0	1	1	0	2	1	3	2	5
Industry [2]	27	0	0	0	2	1	3	5	9	2	5

[1] Street or sidewalk, 6; in automobile on highway, 4; club, 1; park, 2; other places, 2.

[2] Agriculture, 15; manufacture, 3; transportation and other public utility, 3; construction, 2; trade 1; other industries, 3.

The average age at death of those persons having a heat stroke in a public place was 53.8 years. The average age of those persons who suffered heat strokes while engaged in industry was 50.7 years. Excluding the 14 deaths of infants under 1 year, the average age at death of the remaining 235 persons placed in the home group was 71.6 years.

Excessive heat was a less serious cause of death in the western half of the State than in the eastern half. In the western half of the State 19 deaths were reported as follows: Ellis County and Hays City, 3; Smith and Pratt Counties, 2 each; and one death each in Osborne, Russell, Barton, Stafford, Barber, Norton, Trego, Gove, Ford, Clark, Finney, and Hamilton Counties.

One hundred and thirty-six persons suffered heat strokes in cities of more than 2,500 population, constituting 46.7 percent of the heat deaths. This total is compared with an approximate total of 30 percent of the State population living in such cities.

Counties reporting more than 10 deaths (city totals included in county) from heat prostration include the following:

Douglas	12
Lawrence	7
Franklin	11
Ottawa	6
Labette	12
Parsons	9
Leavenworth	10
Leavenworth city	6
Lyon	10
Emporia	4
Miami	17
Shawnee	14
Topeka	9
Wyandotte	43
Kansas City	36

DEATHS DURING WEEK ENDED MAR. 30, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Mar. 30, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	8,611	8,855
Deaths per 1,000 population, annual basis	12.0	12.3
Deaths under 1 year of age	571	659
Deaths under 1 year of age per 1,000 estimated live births	52	61
Deaths per 1,000 population, annual basis, first 13 weeks of year	12.8	12.7
Data from industrial insurance companies:		
Policies in force	67,659,314	67,693,698
Number of death claims	13,584	14,075
Death claims per 1,000 policies in force, annual rate	10.5	10.8
Death claims per 1,000 policies, first 13 weeks of year, annual rate	10.9	11.1

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Apr. 6, 1935, and Apr. 7, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 6, 1935, and Apr. 7, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 6, 1935	Week ended Apr. 7, 1934	Week ended Apr. 6, 1935	Week ended Apr. 7, 1934	Week ended Apr. 6, 1935	Week ended Apr. 7, 1934	Week ended Apr. 6, 1935	Week ended Apr. 7, 1934
New England States.								
Maine		1	1	1	92	14	0	0
New Hampshire			19		1	188	0	0
Vermont		1			7	70	0	0
Massachusetts	0	15			520	2,622	1	2
Rhode Island	2				242	16	1	0
Connecticut	4	3	5		1,191	23	1	1
Middle Atlantic States:								
New York	38	61	[1] 7	[1] 20	2,983	1,058	27	3
New Jersey	29	18	16	15	1,562	702	1	1
Pennsylvania	49	67			6,227	6,371	4	4
East North Central States:								
Ohio	35	32	16	26	1,520	1,621	13	1
Indiana	13	11	41	15	370	804	9	3
Illinois	37	28	21	18	2,947	1,911	23	11
Michigan	13	11	13	3	3,887	148	1	1
Wisconsin	3	4	36	84	1,729	1,429	4	5
West North Central States.								
Minnesota	5	4			1,056	316	1	1
Iowa	10	6	6	9	1,889	258	5	0
Missouri	23	45	56	87	649	839	8	4
North Dakota	8	3	3	1	24	106	0	0
South Dakota	2	4	2		32	350	1	1
Nebraska	4	5		1	392	244	5	1
Kansas		8	3	11	1,726	345	2	1
South Atlantic States:								
Delaware	1	2			22	146	0	1
Maryland [2]	3	8	17	11	61	1,689	7	0
District of Columbia	18	6	5	1	72	375	10	0
Virginia	14	21			938	2,035	5	4
West Virginia	15	14	120	51	440	47	1	1
North Carolina	10	19	8	56	342	3,201	6	0
South Carolina	4	12	233	500	49	639	1	0
Georgia [3]	2	4				780	1	0
Florida		18	1	1	77	444	1	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 6, 1935, and Apr. 7, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 6, 1935	Week ended Apr. 7, 1934	Week ended Apr. 6, 1935	Week ended Apr. 7, 1934	Week ended Apr. 6, 1935	Week ended Apr. 7, 1934	Week ended Apr. 6, 1935	Week ended Apr. 7, 1934
East South Central States:								
Kentucky	4	8	36	32	738	668	1	4
Tennessee [3]	4	7	78	73	82	878	2	2
Alabama [3]	6	11	144	56	441	977	3	0
Mississippi	3	8					3	1
West South Central States:								
Arkansas	6	5	19	34	88	249	0	0
Louisiana	14	19	16	22	138	401	1	0
Oklahoma [4]	13	5	124	80	198	439	5	2
Texas [3]	56	78	614	445	163	1,492	0	2
Mountain States:								
Montana [5]	6		218	402	601	46	2	1
Idaho [5]		1	4	1	33	62	0	0
Wyoming [5]					174	210	0	1
Colorado	5	3			381	374	1	0
New Mexico	0	5	14	6	38	138	2	1
Arizona	1	3	21	27	63	23	0	0
Utah [2]				4	6	440	0	0
Pacific States:								
Washington	6	1	2	3	262	153	1	1
Oregon [5]		1	81	40	210	103	2	0
California [3]	27	44	73	34	1,313	828	12	2
Total	508	630	2,073	2,176	35,976	36,362	174	63
First 14 weeks of year	9,953	11,784	93,384	37,375	352,180	344,599	1,826	781

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 6, 1935	Week ended Apr. 7, 1934	Week ended Apr. 6, 1935	Week ended Apr. 7, 1934	Week ended Apr. 6, 1935	Week ended Apr. 7, 1934	Week ended Apr. 6, 1935	Week ended Apr. 7, 1934
New England States:								
Maine	0	0	13	15	0	0	5	31
New Hampshire	0	0	7	11	0	0	0	1
Vermont	0	0	12	7	0	0	0	0
Massachusetts	0	0	261	234	0	0	2	1
Rhode Island	0	0	6	2	0	0	0	0
Connecticut	1	0	130	77	0	0	0	2
Middle Atlantic States:								
New York	0	3	1,271	835	0	0	4	10
New Jersey	1	1	171	239	0	0	0	1
Pennsylvania	1	2	757	999	0	0	9	6
East North Central States:								
Ohio	0	5	877	820	0	1	3	2
Indiana	0	1	204	190	0	1	0	3
Illinois	1	0	1,197	532	1	5	5	5
Michigan	1	1	247	699	0	0	5	3
Wisconsin	0	0	462	189	26	28	2	2
West North Central States:								
Minnesota	1	0	225	64	4	8	0	1
Iowa	0	0	50	69	3	2	1	0
Missouri	0	0	60	117	2	5	3	2
North Dakota	0	0	74	45	0	0	0	0
South Dakota	1	0	10	6	2	0	0	1
Nebraska	1	0	42	38	23	2	0	0
Kansas	0	1	57	74	23	2	1	4
South Atlantic States:								
Delaware	0	0	20	9	0	0	0	2
Maryland [3]	0	0	126	81	0	0	2	6
District of Columbia	1	0	113	7	0	0	0	0
Virginia	0	0	38	21	2	0	2	8
West Virginia	0	1	64	87	0	1	4	3
North Carolina	3	0	29	27	1	0	11	0
South Carolina	0	0	5	10	0	0	1	5
Georgia [3]	0	0	7	7	0	0	2	7
Florida	0	2	8	1	2	0	4	5

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 6, 1935, and Apr. 7, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 6, 1935	Week ended Apr. 7, 1934	Week ended Apr. 6, 1935	Week ended Apr. 7, 1934	Week ended Apr. 6, 1935	Week ended Apr. 7, 1934	Week ended Apr. 6, 1935	Week ended Apr. 7, 1934
East South Central States:								
Kentucky	0	0	37	57	0	1	1	2
Tennessee [2]	0	0	18	41	0	0	7	4
Alabama [2]	0	0	11	10	10	0	7	1
Mississippi	0	2	3	3	0	6	2	8
West South Central States:								
Arkansas	0	0	3	5	1	1	0	
Louisiana	1	0	7	25	1	1	12	11
Oklahoma [4]	0	0	13	47	0	4	2	1
Texas [3]	3	2	60	100	105	73	20	6
Mountain States:								
Montana [5]	0	0	7	9	3	0	0	1
Idaho [5]	0	0	11	2	0	1	0	0
Wyoming [5]	0	0	17	9	11	1	1	0
Colorado	0	0	277	33	16	5	0	2
New Mexico	0	0	16	13	3	1	3	1
Arizona	0	3	22	25	1	0	0	0
Utah [2]	0	0	92	7	0	0	1	0
Pacific States:								
Washington	0	0	57	66	15	9	2	3
Oregon [5]	0	0	76	20	3	9	3	0
California	5	6	240	141	3	2	3	7
Total	21	30	7,515	6,128	261	169	130	153
First 14 weeks of year	356	286	90,950	84,797	2,749	2,057	1,796	2,086

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Apr. 6, 1935, 11 cases, as follows: Georgia, 5; Tennessee, 1; Alabama, 1; Texas, 3; California, 1.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Rocky Mountain spotted fever, week ended Apr. 6, 1935, 7 cases, as follows: Montana, 2; Idaho, 2; Wyoming, 1; Oregon, 2.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
February 1935										
Arizona	3	13	1,038		207	1	0	146	0	2
Mississippi	7	24	14,824	1,514	136	158	0	59	2	10
Nevada	3	3	31		1		0	16	0	1
March 1935										
Arkansas	7	12	313	68	393	23	0	23	5	
Connecticut	4	19	72		4,137		1	399	0	4
Delaware		3	9		31		0	95	0	1
Indiana	19	94	282		2,764		1	1,041	4	7
Nebraska	10	17	13		2,173		1	175	112	2

February 1935

	Cases
Chicken pox:	
Arizona	132
Mississippi	600
Nevada	45
Dengue:	
Mississippi	7
Dysentery:	
Arizona (amoebic)	5
Mississippi (amoebic)	45
Mississippi (bacillary)	221
German measles:	
Arizona	47

February 1935

	Cases
Hookworm disease:	
Mississippi	224
Mumps:	
Arizona	86
Mississippi	609
Puerperal septicemia:	
Mississippi	28
Rabies in animals:	
Mississippi	18
Trachoma:	
Arizona	35
Mississippi	10

February 1935

	Cases
Undulant fever:	
Mississippi	7
Whooping cough:	
Arizona	157
Mississippi	891
Nevada	5

March 1935

	Cases
Chicken pox:	
Arkansas	165
Connecticut	564

March 1935—Con.

	Cases
Chicken pox—Con.	
Delaware	24
Indiana	21
Nebraska	174
Conjunctivitis:	
Connecticut	4
Epidemic encephalitis:	
Connecticut	3
Indiana	4
German measles:	
Connecticut	608
Mumps:	
Arkansas	85
Connecticut	364
Delaware	45

March 1935—Con.

	Cases
Mumps—Continued.	
Indiana	114
Nebraska	373
Ophthalmia neonatorum:	
Connecticut	3
Paratyphoid fever:	
Connecticut	2
Rabies in animals:	
Connecticut	4
Indiana	70
Septic sore throat:	
Connecticut	8
Indiana	1
Nebraska	5

March 1935—Con.

	Cases
Tetanus:	
Connecticut	1
Delaware	1
Trichinosis:	
Connecticut	2
Undulant fever:	
Connecticut	2
Delaware	1
Indiana	4
Whooping cough:	
Arkansas	111
Connecticut	300
Delaware	12
Indiana	202
Nebraska	20

WEEKLY REPORTS FROM CITIES

City reports for week ended Mar. 30, 1935

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0		0	0	4	3	0	0	1	7	21
New Hampshire:											
Concord	0		0	0	2	3	0	1	0	0	17
Nashua		0		0		0	0		0	0	
Vermont:											
Barre	0		0	0	0	0	0	1	0	0	4
Burlington	1		0	64	0	3	0	0	0	0	5
Massachusetts:											
Boston	5		0	37	30	55	0	12	1	23	238
Fall River	2		0	24	0	2	0	2	0	16	34
Springfield	0		0	160	3	19	0	0	0	14	40
Worcester	1		0	5	4	16	0	3	0	9	
Rhode Island:											
Pawtucket	0		0	0	0	1	0	0	0	0	17
Providence	0		1	106	2	8	0	2	0	4	75
Connecticut:											
Bridgeport	0	1	1	8	3	14	0	1	0	0	32
Hartford	0		0	51	6	10	0	0	1	18	35
New Haven	0	1	1	641	5	0	0	0	0	1	49
New York:											
Buffalo	0	1	2	176	11	64	0	7	0	20	129
New York	25	18	4	1,368	151	789	0	92	3	273	1,555
Rochester	1		0	361	4	19	0	1	0	32	58
Syracuse	0		0	309	6	5	0	0	0	25	47
New Jersey:											
Camden	1	2	1	2	4	8	0	0	0	0	34
Newark	0	8	0	308	4	18	0	10	0	73	100
Trenton	0	0	1	16	6	7	0	1	0	2	32
Pennsylvania:											
Philadelphia	6	6	3	32	44	99	0	30	1	98	497
Pittsburgh	1	7	7	705	24	33	0	3	1	21	172
Reading	0	0	1	43	4	6	0	1	0	2	30
Scranton	0		0	154	0	6	0	0	0	6	
Ohio:											
Cincinnati	6		1	0	9	35	0	4	0	5	111
Cleveland	9	38	2	445	34	55	0	9	0	54	215
Columbus	2	2	2	173	9	28	0	5	0	1	102
Toledo	1	2	1	111	9	21	0	3	0	12	76
Indiana:											
Fort Wayne	1		0	12	4	3	0	1	0	0	22
Indianapolis	1		1	94	15	18	1	4	0	9	119
South Bend	0		0	1	3	4	0	1	0	0	15
Terre Haute	0		0	0	0	1	0	0	0	0	25
Illinois:											
Chicago	9	9	3	1,519	61	683	0	40	0	103	709
Springfield	0	1	0	29	3	16	0	0	0	4	25
Michigan:											
Detroit	5	7	3	2,184	36	122	0	10	0	83	307
Flint	3		1	189	5	19	0	3	0	5	23
Grand Rapids	0		1	104	0	13	0	0	0	7	30

City reports for week ended Mar. 30, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Wisconsin:											
Kenosha	0	------	0	157	0	6	2	1	0	6	7
Milwaukee	1	1	1	219	6	163	0	2	0	40	107
Racine	0	------	0	31	1	22	0	0	0	5	10
Superior	0	------	0	138	2	0	0	0	0	1	6
Minnesota:											
Duluth	------	------	------	------	------	------	------	------	------	------	------
Minneapolis	4	------	0	724	1	110	0	3	0	13	94
St. Paul	0	------	0	26	9	48	1	3	0	7	58
Iowa:											
Davenport	0	------	------	0	------	3	0	------	0	0	------
Des Moines	0	------	0	414	0	1	0	0	1	0	------
Sioux City	2	------	0	5	0	1	0	0	1	5	36
Waterloo	1	------	------	2	------	3	0	------	0	0	------
Missouri:											
Kansas City	7	------	0	189	9	16	0	7	0	1	100
St. Joseph	0	------	0	8	11	2	0	0	0	1	47
St. Louis	16	------	1	19	25	12	0	15	1	7	237
North Dakota:											
Fargo	0	------	0	0	1	6	0	0	0	0	3
Grand Forks	0	------	------	0	------	0	0	------	0	1	------
South Dakota:											
Aberdeen	0	------	------	11	------	1	0	------	0	0	------
Nebraska:											
Omaha	2	------	1	58	6	6	0	2	0	1	45
Kansas:											
Topeka	------	------	------	------	------	------	------	------	------	------	------
Wichita	0	1	1	767	4	1	1	2	0	2	37
Delaware:											
Wilmington	0	------	0	13	11	6	0	0	0	0	33
Maryland:											
Baltimore	1	4	1	31	36	75	0	18	1	18	217
Cumberland	0	------	0	9	0	3	0	0	0	0	6
Frederick	0	------	0	0	1	0	0	0	0	0	4
District of Columbia:											
Washington	14	4	3	52	20	118	0	21	0	3	171
Virginia:											
Lynchburg	1	------	0	34	0	0	0	0	0	6	15
Norfolk	0	------	0	87	8	1	0	1	0	7	39
Richmond	1	------	2	153	1	4	0	1	0	0	45
Roanoke	2	------	0	53	2	0	0	2	0	4	17
West Virginia:											
Charleston	0	4	1	20	2	0	0	2	0	3	36
Huntington	0	------	------	7	------	1	0	------	0	0	------
Wheeling	0	------	0	87	1	8	0	1	0	7	24
North Carolina:											
Raleigh	0	------	0	2	2	1	0	0	0	2	9
Wilmington	0	------	0	0	0	0	0	0	0	2	11
Winston-Salem	0	3	0	2	3	5	0	1	0	14	16
South Carolina:											
Charleston	0	10	2	5	8	0	0	2	0	1	33
Columbia	0	------	0	0	2	0	0	1	0	0	16
Greenville	1	------	0	0	3	2	0	0	0	0	19
Georgia:											
Atlanta	1	9	2	2	5	5	0	7	0	3	71
Brunswick	0	------	0	0	1	0	0	0	0	0	4
Savannah	0	------	0	0	3	3	0	1	1	0	38
Florida:											
Miami	0	------	0	0	4	0	0	1	0	0	28
Tampa	1	------	0	50	0	2	0	1	1	0	24
Kentucky:											
Ashland	0	2	0	18	0	1	0	0	0	0	0
Lexington	1	------	0	5	1	1	0	1	1	1	18
Louisville	3	3	0	410	16	24	0	3	1	20	70
Tennessee:											
Memphis	4	------	1	0	12	4	0	2	0	7	67
Nashville	0	------	1	8	5	2	0	3	0	9	50
Alabama:											
Birmingham	1	7	1	25	6	4	0	4	1	2	62
Mobile	0	------	2	1	1	1	0	3	0	0	27
Montgomery	0	1	0	26	0	0	0	0	0	6	------
Arkansas:											
Little Rock	0	------	0	82	1	0	0	0	0	6	2
Louisiana:											
New Orleans	12	6	2	23	13	2	0	14	4	0	137
Shreveport	0	------	0	3	9	1	0	4	2	1	68

City reports for week ended Mar. 30, 1935—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Oklahoma:											
Oklahoma City	1	10	1	20	13	2	0	1	0	0	40
Texas:											
Dallas	8	1	1	0	10	3	0	4	0	0	63
Fort Worth	0	------	1	1	9	5	0	2	0	1	40
Galveston	0	------	0	2	1	1	0	1	0	0	13
Houston	11	------	2	1	5	0	0	3	0	0	64
San Antonio	2	------	3	2	4	2	0	7	1	0	58
Montana:											
Billings	0	------	0	8	0	2	0	0	0	0	4
Great Falls	0	------	0	0	0	0	0	0	0	4	8
Helena	0	------	0	30	1	0	0	0	0	1	3
Missoula	0	------	0	25	2	0	0	0	0	0	4
Idaho:											
Boise	0	------	0	11	0	3	0	1	0	0	4
Colorado:											
Denver	6	49	1	255	4	181	0	5	0	21	89
Pueblo	0	------	1	165	2	14	0	1	0	6	12
New Mexico:											
Albuquerque	0	2	0	3	2	2	0	1	0	6	8
Utah:											
Salt Lake City	0	------	0	7	1	95	0	3	0	83	36
Nevada:											
Reno	0	------	0	0	0	0	0	0	0	0	4
Washington:											
Seattle	0	------	2	107	8	5	2	3	2	7	93
Spokane	0	1	0	139	2	6	0	1	0	0	35
Tacoma	0	------	0	3	2	0	0	1	0	0	23
Oregon:											
Portland	0	2	0	124	7	9	0	3	0	0	68
Salem	0	4	------	0	------	3	0	------	0	0	------
California:											
Los Angeles	28	30	2	59	20	60	2	12	0	13	343
Sacramento	1	------	0	44	0	6	0	5	2	2	25
San Francisco	6	6	2	11	11	25	0	8	0	20	184

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts:			
Worcester	0	0	1
Rhode Island:			
Providence	1	1	0
New York:			
Buffalo	1	0	0
New York	19	11	1
New Jersey:			
Camden	0	0	1
Newark	1	0	0
Pennsylvania:			
Philadelphia	2	2	1
Pittsburgh	1	1	0
Ohio:			
Cincinnati	10	4	0
Cleveland	1	1	0
Columbus	1	1	0
Toledo	3	2	0
Indiana:			
Indianapolis	2	0	0
Illinois:			
Chicago	13	2	0
Springfield	5	4	0
Michigan:			
Detroit	2	0	0
Wisconsin:			
Milwaukee	1	1	0
Iowa:			
Sioux City	1	0	0
Missouri:			
Kansas City	1	2	0
St. Joseph	1	2	0
St. Louis	6	1	0

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Kansas:			
Wichita	2	0	0
Maryland:			
Baltimore	4	0	0
District of Columbia:			
Washington	13	4	0
Virginia:			
Lynchburg	1	0	0
Norfolk	1	1	0
West Virginia:			
Wheeling	0	1	0
North Carolina:			
Winston-Salem	1	2	1
Kentucky:			
Louisville	3	2	0
Tennessee:			
Nashville	2	1	0
Alabama:			
Birmingham	1	1	0
Arkansas:			
Little Rock	1	1	0
Oklahoma:			
Oklahoma City	1	1	0
Texas:			
Fort Worth	0	0	1
California:			
Los Angeles	0	0	4
San Francisco	0	0	1

Epidemic encephalitis.—Cases: Springfield, Mass., 1; New York, 1; Indianapolis, 2; St. Louis, 1 Birmingham, 2.
Pellagra.—Cases: Boston, 1; Winston-Salem, 1; Atlanta, 2; New Orleans, 1.
Typhus fever.—Cases: Atlanta, 2.
Dengue.—Cases: Miami, 1.
Rabies in man.—Deaths: Boston, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended March 23, 1935.—During the 2 weeks ended March 23, 1935, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis		1			1				3	5
Chicken pox		11	16	281	450	107	58	5	119	1,047
Diphtheria		3	1	10	12	9	2		1	38
Dysentery				6						6
Erysipelas				9	6	7	1	3	3	29
Influenza		242	2	20	160	8			639	1,071
Lethargic encephalitis					1					1
Measles		317	69	1,210	5,401	493	238	32	96	7,856
Mumps		12			482	121	1	14	46	676
Pneumonia		7			39		3		26	75
Poliomyelitis				3	2					5
Scarlet fever		30	10	285	274	42	38	16	50	745
Trachoma							4		2	6
Tuberculosis	8	3	11	111	82	23	25	6	39	308
Typhoid fever				45		1			3	49
Undulant fever				1	3		1		2	7
Whooping cough		3	2	249	274	63	101	4	105	801

ITALY

Communicable diseases—4 weeks ended October 14, 1934.—During the 4 weeks ended October 14, 1934, certain communicable diseases were reported in Italy, as follows:

Disease	Sept. 17-23		Sept. 24-30		Oct. 1-7		Oct. 8-14	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	35	29	45	30	25	20	11	11
Cerebrospinal meningitis	7	7	3	3	8	7	4	4
Chicken pox	82	58	51	41	56	39	57	37
Diphtheria and croup	427	225	574	295	629	340	625	331
Dysentery	21	13	39	20	35	17	40	29
Lethargic encephalitis	2	2	1	1				
Measles	330	131	476	160	469	156	488	137
Poliomyelitis	17	17	18	17	15	12	17	16
Scarlet fever	324	150	351	106	388	175	360	171
Typhoid fever	1,056	529	1,140	582	1,036	510	929	501

JAMAICA

Communicable diseases—4 weeks ended March 23, 1935.—During the 4 weeks ended March 23, 1935, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox	11	28	Poliomyelitis		2
Diphtheria	1	1	Puerperal fever		3
Dysentery	8	9	Tuberculosis	53	107
Erysipelas	1	1	Typhoid fever	10	41
Leprosy		3			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Mar. 29, 1935, pp. 454-467. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Apr. 26, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Plague

Hawaii Territory—Hawaii Island—Hamakua District—Paauhau.—On March 18, 1935, one case of plague which proved fatal on March 25, 1935, was reported at Paauhau, Hamakua District, Island of Hawaii, Hawaii Territory. On March 26, 1935, two plague-infected rats were reported at Paauhau Landing, Hamakua District, Island of Hawaii, Hawaii Territory.

Morocco—Region of Saffi.—On March 30, 1935, 9 cases of plague with 5 deaths were reported in Ahmar Tribe, Region of Saffi, Morocco.

Typhus Fever

Egypt—Suez.—During the week ended March 30, 1935, one case of typhus fever was reported at Suez, Egypt.

Yellow Fever

Africa.—A report dated February 4, 1935, in regard to yellow fever in West Africa, states that the disease was present in Gambia, Nigeria, Ivory Coast, Gold Coast, and Sierra Leone. The Bathurst area, in Gambia, was said to be the most heavily affected region. No case had been reported in Liberia.

Sierra Leone—Freetown.—On March 21, 1935, one case of yellow fever was reported at Freetown, Sierra Leone.

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UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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SICKNESS AMONG MALE INDUSTRIAL EMPLOYEES DURING THE FINAL QUARTER OF 1934 AND THE ENTIRE YEAR [1]

By DEAN K. BRUNDAGE, *Statistician, Office of Industrial Hygiene and Sanitation, United States Public Health Service*

Cases of sickness causing disability for more than 1 week among 153,167 male industrial workers occurred at approximately the same rate in the fourth quarter of 1934 as in the corresponding period of 1933. This result may be regarded as favorable, inasmuch as it represents a decrease of more than 12 percent from the average frequency of 8-day and longer cases in the same quarter of the years 1929 to 1933, inclusive.

For the year as a whole the sickness frequency rate was 7 percent below the rate in 1933. A few delayed reports of cases may increase slightly the final figures for 1934, but such revision seldom increases the rate appreciably. It is expected that the complete returns will still show a lower rate in 1934 than in the preceding year. Such a result may be considered noteworthy, since 1933 was a record year for low sickness incidence as far back (1921) as the data are available for the sample of the industrial population under consideration. Compared with 1929, the decrease in the frequency of cases of sickness and nonindustrial accidents causing disability for 8 days and longer is nearly 30 percent.

The record covers the same group of companies in 1934 as in 1933. The rates for the fourth quarter of the years 1929 to 1933 include 19 of these companies which employed about 78 percent of the men covered in the 5-year average. The rates therefore appear to be fairly comparable for the different time periods shown in the table.

The data presented are those of industrial sick-benefit organizations maintained either by the company or by its employees or cooperatively by both. The reporting companies employ men in all parts of the United States, but most of them are located in the North Central, North Atlantic, and New England States.

[1] The report for the third quarter and the first 9 months of 1934 was published in the Public Health Reports of Jan. 25, 1935, vol. 50, no. 4, pp. 95–98.

TABLE 1.—*Frequency of disability lasting 8 calendar days or longer in the fourth quarter and the full year 1934, compared with corresponding periods of 1933. (Male morbidity experience of industrial companies which reported their cases to the U. S. Public Health Service)* [1]

Diseases and disease groups causing disability. (Numbers in parentheses are disease title numbers from the International List of the Causes of Death, fourth revision, Paris, 1929.)	Annual number of disabilities per 1,000 men in—				
	Fourth quarter of—			Full year—	
	1934	1933	5 years, 1929–33	1934	1933
Sickness and nonindustrial injuries [2]	77.1	79.4	90.2	76.8	82.5
Nonindustrial injuries	12.5	13.6	13.4	12.0	11.1
Sickness [2]	64.6	65.8	76.8	64.8	71.4
Respiratory diseases	27.0	27.5	32.4	24.1	28.6
Bronchitis, acute and chronic (106)	3.7	3.3	4.1	3.1	2.8
Diseases of the pharynx and tonsils (115a)	3.6	4.0	4.7	4.2	3.9
Influenza, grippe (11)	12.9	12.4	15.9	10.1	15.2
Pneumonia, all forms (107–109)	2.0	1.9	2.4	1.9	1.7
Tuberculosis of the respiratory system (23)	.8	.7	.8	.7	.9
Other respiratory diseases (104, 105, 110–114)	4.0	5.2	4.5	4.1	4.1
Nonrespiratory diseases	37.6	38.3	44.4	40.7	42.8
Diseases of the stomach, cancer excepted (117–118)	2.9	3.0	3.6	3.1	3.3
Diarrhea and enteritis (120)	1.2	1.0	1.2	1.2	1.0
Appendicitis (121)	3.9	3.6	3.6	4.0	3.4
Hernia (122a)	1.4	1.0	1.5	1.4	1.3
Other digestive diseases (115b, 116, 122b–129)	2.6	2.9	2.9	2.8	3.2
Rheumatic group, total	7.2	8.4	10.3	8.3	9.8
Rheumatism, acute and chronic (56, 57)	2.9	3.5	4.5	3.9	4.9
Diseases of the organs of locomotion (156b)	2.3	2.8	3.4	2.6	2.7
Neuralgia, neuritis, sciatica (87a)	2.0	2.1	2.4	1.8	2.2
Neurasthenia and the like (part of 87b)	.6	.8	1.1	.8	.8
Other diseases of the nervous system (78–85, part of 87b)	1.4	1.3	1.1	1.3	1.5
Diseases of the heart and arteries, and nephritis (90–99, 102, 130–132)	2.8	3.0	3.5	3.1	3.6
Other genito-urinary diseases (133–138)	2.2	2.3	2.3	2.3	2.3
Diseases of the skin (151–153)	2.3	2.7	3.1	2.5	2.7
Epidemic and endemic diseases except influenza, (1–10, 12–18, 33, 37, 38, part of 39 and 44)	1.8	1.8	1.7	2.5	2.0
Ill-defined and unknown causes (200)	1.6	1.5	1.8	1.7	2.0
All other diseases (19–22, 24–32, 36, part of 39 and 44, 40–43, 45–55, 58–77, 88, 89, 100, 101, 103, 154–156a, 157, 162)	5.7	5.0	6.7	5.7	5.9
Average number of males covered in the record	153,167	143,766	152,173	161,096	142,232
Number of companies included	33	33	37	[3] 34	[3] 34

[1] In 1933 and 1934 the same companies are included. The rates for the fourth quarter of the years 1929 to 1933 include 19 of these companies, which employed an average of 1[illegible]0,118 men during these months, or 78 percent of the 152,173 men representing the sample population for the 5 years.
[2] Exclusive of disability from venereal diseases.
[3] For 1 of these companies the record covers only the first 9 months of the year, but the rates represent annual sickness frequency based on the 9 months' experience.

Disabilities of less than 1 week's duration are not included. The present report is confined to the morbidity frequency rates of males only. A later report, giving the sickness incidence rates in 1934 in comparison with those for earlier years, will include the sickness rates of female industrial employees.

Among the 153,167 men covered in the record for the fourth quarter of 1934, the frequency of respiratory diseases was practically the same as in the final quarter of the preceding year. Influenza, pneumonia, tuberculosis, and bronchitis occurred at slightly greater frequency than in the corresponding period of 1933, but these increases were offset by lower rates for diseases of the pharynx and tonsils, and for the group of "other respiratory diseases." With the exception of tuberculosis, which showed the same frequency in the fourth

quarter of 1934 as the average incidence during the fourth quarter of the 5 preceding years, the rates for the other respiratory diseases in the fourth quarter were all less than the corresponding rate for the same period of the years 1929 to 1933, inclusive.

For the year as a whole, the respiratory disease rate was lower than in 1933. Cases of influenza were less frequent in 1934 than in 1933 by almost one-third. A decrease is shown also in the frequency of tuberculosis. The pneumonia rate, however, was higher than in the preceding year. The frequency of disabilities of 8 days and longer due to bronchitis and to diseases of the pharynx and tonsils increased somewhat over the incidence rates recorded for these diseases in 1933.

For nonrespiratory diseases as a group the rate was about the same in the fourth quarter of 1934 as in the corresponding part of 1933. For the full year, however, the rate was slightly below that recorded for 1933.

In each quarter of 1934 the frequency of appendicitis was greater than in the corresponding quarter of 1933; and for the year as a whole, an increase of 18 percent is shown.

A rather large percentage increase in the fourth quarter, but only a small increase for the year as a whole, is shown in the frequency of cases of disability due to hernia.

The rheumatic disease group decreased in frequency in the fourth quarter and in the year 1934. Compared with the 5-year average, the fourth quarter rates for the three subgroups under the "rheumatic group" show decreases ranging from 17 to 35 percent.

The incidence rate of neurasthenia decreased in the fourth quarter of 1934, but the rate for the year was the same as in 1933. The frequency of other diseases of the nervous system was somewhat lower in 1934 than in the preceding year.

It is gratifying to find a decrease of 14 percent in 1934 as compared with 1933 in the frequency of the degenerative diseases embraced in the category "diseases of the heart and arteries, and nephritis." Other genito-urinary diseases, however, show no change in incidence.

For diseases of the skin the rates decreased both in the fourth quarter of 1934 and in the full year.

Gaged by the frequency of claims for sickness benefits in a sample of the male industrial population of the country, disabilities of more than 1 week's duration appear to have occurred less often in the fourth quarter of 1934 than they did on the average in the corresponding period of the 5 preceding years, and the rate of morbidity for the full year appears to have been somewhat lower than in 1933. The absence of serious epidemics of respiratory diseases during the last few years has made possible the establishment of new "lows" in the frequency of morbidity as well as in the rate of mortality in the United States.

MORTALITY IN CERTAIN STATES DURING 1934, WITH COMPARATIVE DATA FOR RECENT YEARS [1]

For several years the United States Public Health Service has secured current mortality data from the State health departments of as many States as could furnish the information, and has published death rates for important causes. The rates are computed from preliminary reports, and, because of (*a*) some lack of uniformity in the method of classifying deaths according to cause, (*b*) some delayed death certificates, and (*c*) various other reasons, these preliminary rates cannot be expected to agree in all instances with final rates published by the Bureau of the Census. The final figures are based on a complete review and retabulation of the individual death certificates from each State. The preliminary rates given in the accompanying tables are intended to serve as a current index of mortality until final figures are available.

For purposes of comparison, the mortality rates for a few preceding years are given. These comparative rates are from the same source as are the current reports. Although final figures are often available for earlier years, the provisional figures are retained as being more comparable with current preliminary rates.

In table 1 the death rates for important causes for groups of States have been brought together. The majority of the rates are based on data from 28 States, with a population of nearly 95 million. The detailed tables show rates for each State. The summary table includes for each cause every State that is included in the detailed tables. While the rates in this group of States may not be the same as those for the total registration area, it is highly probable that the trend of the rates in these States will be comparable with the trend in the total area.

Table 2 is a summary of death rates in each of the 4 quarters of the year for a group of 25 States with available data of this kind. Tables 3 and 4 give rates for the year as a whole for each State.

The death rate from all causes in the 28 States was 10.9, as compared with 10.5 in 1933 and 10.8 and 11 in 1932 and 1931, respectively. While the increase over 1933 was not large, it was widespread; 22 of the 28 States showed an increase, only 5 a decrease, and in 1 State the rate was the same in the 2 years. The rate for each quarter of 1934 was above the corresponding quarter of 1933, but the differences were small.

Infant mortality was also slightly higher in 1934—58 per 1,000 live births, as compared with 56 in 1933. Of 27 States with data for both years, the rate increased in 19 and decreased in 8 States.

[1] From the Office of Statistical Investigations, U. S. Public Health Service.

Throughout the years of depression the tuberculosis death rate in the general population has continued a steady decline which started many years ago. The rate for 1934 was 54.3 per 100,000, as compared with 56.6 and 60 for 1933 and 1932, respectively. The relative decline from the preceding year, 4.6 percent, was slightly less than in 1933 and 1932 (5.7 and 7.3 percent), but was about the same as in 1931 (4.8 percent). Of the 28 States, 25 showed a decline in the tuberculosis rate in 1934 from that in 1933, and 3 an increase.

The year 1934 was exceptionally free from influenza; the death rate of 15.2 per 100,000 from this cause was less than in any year since 1929. In every one of the 28 States the rate was lower in 1934 than in 1933. There was a small epidemic in the early weeks of 1935 which affected the last week or two of 1934 but made no impression upon the rate for the year as a whole.

The pneumonia death rate is usually high or low in proportion to the presence of influenza during the year. In 1934, however, the pneumonia rate was higher than in 1933, while the reverse was true of the influenza rate. The pneumonia rate for 1934 was 78.2 per 100,000, as compared with 69.3 and 77.1 in 1933 and 1932, respectively. In 23 of the 28 States the rate was higher in 1934 than in 1933.

The exceptionally high mortality from whooping cough and measles may have a bearing on the high pneumonia rate. Both of these diseases are frequently complicated by pneumonia, and some of the deaths credited to pneumonia may have been preceded by these diseases but the facts have been omitted from the death certificates. Both the measles and whooping cough rates in 1934 were the highest for the 5 years included in the table. For both diseases 23 of the 28 States showed increases over 1933. Although the death rates from the communicable diseases may be expected to fluctuate from year to year, large increases of both measles and whooping cough in the same year in such a large proportion of the States would not normally be expected.

In spite of high poliomyelitis rates in the Western States in 1934, the rate for the group of 28 States was the same as in 1933. Of the 28 States, 15 had higher rates, 9 had lower, and in 4 States the rate was the same. Of the States included, the largest excesses over 1933 were in California, Montana, and Idaho. Since the populations of the Eastern States are generally larger than those of the Western, an epidemic in the West has less effect upon the rate for the country as a whole than an eastern epidemic.

Reports of increases in meningococcus meningitis began in the early weeks of 1935, but the 1934 death rate for this disease was lower than in any of the 5 years included in the tables. Of the 28

States, 12 had higher rates in 1934 than 1933, 14 had lower rates, and in 2 States there was no change.

The scarlet fever rate was the same in 1934 as in 1933. Of the 28 States, the rate in 1934 was higher in 12 States, lower in 15 States, and the same in 1 State.

Diphtheria continued an uninterrupted decline, the rate of 2.7 per 100,000 in 1934 being less than in any preceding year. Of the 28 States, 18 showed a decline from 1933, 9 an increase, and in 1 State the rate was the same in the 2 years.

Typhoid fever continued its steady decline to a new low death rate of 2.3 per 100,000. In 12 of the 28 States the rate was higher in 1934 than in 1933, in 15 it was lower, and in 1 State the rate was the same in the 2 years. Deaths from diarrhea and enteritis under 2 years of age amounted to 11.1 per 100,000 total population, as compared with 10 and 10.3 in 1933 and 1932, respectively. In 20 of the 28 States there was an increase in the rate in 1934 over 1933, in 7 a decrease, and in 1 State the rate remained the same.

The death rate from diabetes was higher in 1934 than in 1933. In 21 of the 28 States there was an increase in 1934 as compared with 1933, in 6 States a decrease, and in 1 State the rate was the same in the 2 years.

Cancer continued its steady increase, the rate of 108 per 100,000 in 1934 being greater than in any other year included. Twenty-two of the twenty-eight States increased in 1934 as compared with 1933.

Diseases of the heart continued an upward trend, the increase this year being considerably greater than in preceding years. Twenty-two of the twenty-seven States with available data had higher rates in 1934 than in 1933. The death rate for nephritis was slightly higher in 1934 than in 1933. Of the 27 States with data available for both 1934 and 1933, 19 had a higher rate and 8 a lower rate in 1934 than in 1933. In the group of States with available data on cerebral hemorrhage, the rate in 1934 was slightly higher than in 1933. However, in 15 of the 26 States there was a decrease in 1934 as compared with 1933.

Although the 1934 death rate represents some increase over 1933, it is about the same as in 1932 and not up to the level of 1931 and earlier years.

TABLE 1.—*Summary of mortality from certain causes in a group of States, 1930–34* [1]

Diseases (numbers in parentheses are from the International List of Causes of Death, fourth revision, 1929)	1934	1933	1932	1931	1930
	Death rate per 1,000 population				
28 States (population July 1, 1934: 94,047,000):					
All causes	10.9	10.5	10.8	11.0	11.2
	Deaths under 1 year per 1,000 live births				
27 States (live births 1934: 1,499,000):					
Total infant mortality	58	56	57	61	62
21 States (live births 1934: 1,221,000):					
All infant mortality except malformations and early infancy	25	24	25	28	29
	Deaths of mothers per 1,000 live births				
27 States (live births 1934: 1,499,000):					
Maternal mortality	5.4	5.6	5.9	6.2	6.2
	Death rate per 100,000 population				
28 States (population July 1, 1934: 94,047,000):					
Typhoid fever (1, 2)	2.3	2.5	2.9	3.5	3.7
Diarrhea and enteritis under 2 years (119)	11.1	10.0	10.3	14.0	17.8
Measles (7)	4.2	1.6	1.5	2.5	2.9
Whooping cough (9)	5.1	3.2	4.1	3.5	4.2
Scarlet fever (8)	2.0	2.0	2.1	2.1	1.9
Diphtheria (10)	2.7	2.9	3.8	4.1	4.6
Acute anterior poliomyelitis (16)	.6	.6	.7	1.9	1.1
Meningococcus meningitis (18)	.8	1.0	1.3	2.1	3.1
Influenza (11)	15.2	23.7	27.5	24.8	18.5
Pneumonia, all forms (107–109)	78.2	69.3	77.1	81.7	83.0
Tuberculosis, all forms (23–32)	54.3	56.6	60.0	64.7	68.0
Cancer (45–53)	107.9	104.1	102.1	98.9	97.8
Diabetes (59)	22.9	21.9	22.0	20.6	19.3
27 States (population July 1, 1934: 90,746,000):					
Diseases of the heart (90–95)	243.9	225.9	219.9	212.1	210.0
Nephritis, all forms (130–132)	83.3	81.2	83.8	83.1	87.4
26 States (population July 1, 1934: 89,091,000):					
Cerebral hemorrhage, apoplexy (82, a, b)	80.4	79.6	81.0	80.0	80.5

[1] See tables 3 and 4 for names of States included for each disease. The District of Columbia is counted as a State.

TABLE 2.—*Mortality from certain causes in each quarter of 1934, 1933, 1932, and 1931, in the 25 States[1] with available data*

[Population July 1, 1931: 80,313,000]

Period	All causes, rate per 1,000 population	Rate per 1,000 live births			Death rate per 100,000 population (annual basis)																				
		Total infant mortality	All except malformations and early infancy	Maternal mortality	Typhoid fever (1, 2)	Measles (7)	Scarlet fever (8)	Whooping cough (9)	Diphtheria (10)	Influenza (11)	Poliomyelitis (16)	Lethargic encephalitis (17)	Meningococcus meningitis (18)	Tuberculosis, all forms (23-32)	Cancer, all forms (45-53)	Diabetes (59)	Diseases of the nervous system (78-89)	Cerebral hemorrhage, apoplexy (82a-b)	Diseases of the circulatory system (90-103)	Diseases of the heart (90-95)	Diseases of the respiratory system (104-114)	Pneumonia, all forms (107-109)	Diseases of the digestive system (115-129)	Diarrhea and enteritis under 2 years (119)	Nephritis (130-132)
January-December:																									
1934	10.9	57	26	5.5	2.4	3.9	1.9	4.6	2.5	15.2	0.7	0.6	0.8	51.2	110.3	23.3	103.3	81.8	275.0	215.6	89.7	78.0	70.0	10.5	81.4
1933	10.6	56	25	5.6	2.4	1.7	1.9	3.1	2.8	24.0	.7	.8	.8	56.5	106.4	22.3	103.4	80.6	258.7	226.4	82.1	70.6	68.3	9.7	70.5
1932	10.9	57	26	5.9	2.9	1.6	2.0	4.1	3.7	28.8	.7	.7	1.2	60.3	104.2	22.4	105.6	82.0	255.2	221.8	90.9	78.6	68.5	10.3	81.5
1931	11.0	60	29	6.1	3.5	2.4	1.9	3.5	3.7	24.5	2.0	.9	2.1	64.8	100.8	20.9	106.2	80.8	217.2	213.2	95.6	83.3	74.1	13.9	81.0
January-March:																									
1934	11.9	64	31	6.0	.9	5.6	3.1	4.6	2.6	23.5	.3	.7	.9	57.4	107.2	26.2	114.0	89.3	310.6	275.6	136.0	120.9	62.9	5.8	89.7
1933	11.8	65	32	6.1	1.2	2.0	2.7	3.0	2.5	61.3	.3	.8	1.1	60.3	101.9	25.7	113.7	88.7	286.5	251.0	121.9	108.8	59.6	5.2	86.0
1932	11.8	60	28	6.3	1.9	2.2	3.0	4.9	4.6	41.0	.4	.8	1.9	65.3	102.6	25.0	114.5	89.4	282.5	245.5	131.1	117.2	61.7	5.4	89.6
1931	12.5	74	40	6.9	1.3	3.3	2.8	3.3	3.6	60.0	.5	1.0	3.2	69.3	100.8	23.6	117.7	89.1	264.5	245.7	166.7	130.6	65.5	7.2	88.8
April-June:																									
1934	11.1	59	26	6.2	1.8	7.5	2.1	5.8	1.4	12.7	.6	.5	.9	57.9	111.4	23.3	101.1	81.7	276.5	216.9	91.9	79.0	69.7	8.9	83.4
1933	10.4	54	23	6.0	1.7	3.3	2.2	3.0	1.4	12.7	.4	.7	.9	60.0	106.3	21.6	101.3	80.1	255.9	222.9	71.9	60.3	67.7	8.8	81.1
1932	10.8	58	26	6.3	1.7	3.3	2.5	4.9	2.4	24.3	.4	.7	1.4	65.4	103.9	22.1	107.5	82.4	256.0	222.2	84.6	73.6	67.2	8.9	82.8
1931	11.1	58	26	6.6	1.8	4.8	2.6	3.4	2.2	22.7	.5	1.1	2.5	69.5	101.7	20.6	109.7	83.0	248.1	214.6	90.0	78.0	70.4	9.1	83.4
July-September:																									
1934	9.9	51	21	5.0	4.2	1.5	.8	4.8	1.6	4.7	1.1	.8	.6	50.4	103.7	19.8	90.9	72.3	233.5	210.3	43.9	35.8	80.0	17.1	72.8
1933	9.4	49	20	5.3	4.1	.5	.8	3.5	1.9	4.8	1.3	.9	.6	53.1	105.2	19.0	90.3	70.4	219.5	191.4	42.0	33.3	77.8	15.4	70.5
1932	9.5	50	21	5.8	5.0	.5	.7	3.9	2.5	5.6	1.3	.7	.8	55.3	103.0	18.2	90.9	70.1	213.5	183.9	42.6	33.9	80.2	18.0	71.7
1931	9.9	51	24	5.8	6.1	.7	.8	3.9	2.2	5.0	5.2	.7	1.4	61.8	99.0	17.9	93.9	70.0	210.0	180.0	44.8	35.8	87.7	23.7	71.6
October-December:																									
1934	10.9	51	24	4.8	2.6	1.0	1.7	3.3	4.5	15.0	.6	.6	.8	51.2	112.6	23.9	104.2	84.0	279.6	249.6	88.0	77.0	67.1	10.0	79.5
1933	10.8	56	25	5.1	2.8	.8	2.1	2.8	5.5	14.9	.6	.8	.7	52.7	108.0	22.9	105.4	83.4	275.5	240.6	93.3	80.5	67.8	9.4	80.7
1932	11.4	59	29	5.4	3.0	.6	1.9	2.7	5.4	41.6	.7	.7	.9	55.3	107.1	24.3	109.1	85.5	260.2	235.8	105.7	90.0	64.7	8.8	82.1
1931	10.5	56	25	5.3	4.7	.6	1.4	3.3	6.8	11.2	1.8	.7	1.5	58.6	101.8	21.4	103.6	80.4	246.5	212.7	82.5	70.0	72.6	15.2	80.2

[1] Includes all States for which data are available by quarters for the 4 years covered. The States are: Alabama, California, Connecticut, District of Columbia, Georgia, Idaho, Indiana, Iowa, Kansas, Louisiana, Maryland, Michigan, Minnesota, Montana, Nebraska, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, South Dakota, Tennessee, Virginia, West Virginia, and Wisconsin.

TABLE 3.—*Mortality in certain States, 1930-34*

State	Deaths, all causes, per 1,000 population					Maternal mortality, per 1,000 live births				
	1934	1933	1932	1931	1930	1934	1933	1932	1931	1930
Total	10.9	10.5	10.8	11.0	11.2	5.4	5.6	5.9	6.2	6.2
Alabama	10.6	9.5	10.0	10.4	11.2	6.1	6.9	7.1	7.1	8.1
California	11.1	11.2	10.9	11.3	11.6	4.1	4.8	5.5	6.3	5.3
Connecticut	10.2	10.1	10.1	10.1	10.5	5.3	6.0	5.7	6.8	8.5
District of Columbia	16.5	15.9	16.1	15.9	15.2	3.6	4.8	7.9	6.1	9.1
Georgia	11.8	10.1	10.9	11.1	11.8	7.4	7.7	9.5	10.0	10.6
Idaho	10.6	9.6	9.2	9.6	9.7	5.8	4.1	4.4	4.5	4.4
Illinois	11.1	10.5	10.5	11.1	10.9	5.2	5.0	5.1	5.4	5.4
Indiana	12.3	11.6	11.8	11.9	12.1	5.3	5.4	4.9	5.6	5.5
Iowa	10.6	10.2	10.2	10.3	10.6	5.6	4.9	4.4	4.1	7.0
Kansas	10.5	10.1	10.1	10.0	10.4	5.5	4.8	5.4	5.8	7.0
Louisiana	10.6	10.6	10.6	10.9	11.8	8.1	8.1	8.2	8.9	9.3
Maryland	12.3	12.2	12.5	13.2	13.2	5.1	4.9	4.6	6.0	5.3
Michigan	9.9	9.6	9.7	9.8	10.6	5.3	5.5	5.7	5.9	5.9
Minnesota	10.1	9.6	9.6	9.6	9.7	4.8	4.5	4.1	4.6	4.8
Mississippi	9.9	10.4	9.9	10.8	10.8	------	------	------	------	------
Montana	10.4	9.7	9.7	9.7	9.8	5.7	5.8	5.7	7.0	6.8
Nebraska	9.5	9.2	9.2	9.1	9.4	5.5	4.2	5.0	5.1	5.3
New Jersey	10.3	10.4	10.1	10.6	10.7	5.4	5.1	5.7	5.9	5.7
New York	11.1	11.2	11.3	11.6	11.7	5.2	6.8	6.1	5.9	5.6
North Carolina	10.7	9.3	9.4	10.2	11.4	6.9	6.4	6.8	7.8	7.6
Ohio	11.2	10.7	11.1	11.1	11.4	5.6	5.9	5.9	6.0	5.5
Pennsylvania	10.8	10.6	10.9	11.3	11.3	5.2	5.1	5.4	5.7	5.3
Rhode Island	10.7	11.1	11.5	11.4	11.6	5.7	5.6	5.7	5.5	5.6
South Dakota	9.3	8.8	8.2	8.6	8.5	4.5	4.1	3.7	4.9	5.6
Tennessee	10.9	10.2	10.7	10.7	11.4	6.3	6.1	6.6	6.8	7.9
Virginia	11.6	10.8	10.9	11.6	11.7	5.7	5.6	6.6	7.4	6.6
West Virginia	10.0	9.4	10.0	10.0	10.4	5.3	5.1	5.1	5.2	5.7
Wisconsin	10.0	9.8	10.0	10.1	10.3	4.2	4.7	4.3	4.3	4.8
Hawaii	8.8	9.6	9.7	9.8	10.4	5.4	5.8	------	------	------
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	8.3	8.4	8.4	8.5	8.4	------	------	------	------	------

State	Infant mortality rate per 1,000 live births									
	Total infant mortality					All except malformations and early infancy				
	1934	1933	1932	1931	1930	1934	1933	1932	1931	1930
Total	58	56	57	61	62	25	24	25	28	29
Alabama	69	66	61	65	73	43	40	36	40	45
California	52	53	53	57	59	22	21	23	26	29
Connecticut	50	48	48	54	56	------	------	------	------	------
District of Columbia	64	65	73	71	70	32	27	33	35	36
Georgia	80	68	65	69	78	------	------	------	------	------
Idaho	50	47	58	59	51	18	14	32	27	24
Illinois	58	51	52	56	56	24	20	21	25	23
Indiana	56	53	55	57	57	27	24	26	28	26
Iowa	53	50	48	51	56	21	19	20	22	22
Kansas	48	53	48	48	52	19	23	18	19	23
Louisiana	79	71	66	68	80	40	39	36	40	49
Maryland	69	65	70	79	73	33	31	35	45	38
Michigan	52	51	54	56	63	19	18	22	22	27
Minnesota	49	50	43	47	47	18	20	15	17	17
Montana	52	49	49	56	59	------	------	------	------	------
Nebraska	46	51	43	47	49	16	19	15	19	19
New Jersey	49	46	52	57	57	------	------	------	------	------
New York	52	54	53	57	58	21	22	22	33	26
North Carolina	77	66	67	73	77	------	------	------	------	------
Ohio	53	52	60	59	58	21	19	26	26	23
Pennsylvania	54	52	59	65	66	26	24	31	34	30
Rhode Island	54	56	57	61	62	18	17	23	22	26
South Dakota	59	55	51	58	56	27	25	23	28	26
Tennessee	75	71	69	70	71	47	44	42	44	44
Virginia	68	63	66	72	71	------	------	------	------	------
West Virginia	67	76	75	77	81	33	40	38	39	43
Wisconsin	50	49	51	53	56	19	17	19	20	23
Hawaii	75	72	76	75	82	48	44	------	------	------

TABLE 4.—*Death rates for various causes per 100,000 population*

State	Typhoid fever (1, 2)					Diarrhea and enteritis under 2 years (119)				
	1934	1933	1932	1931	1930	1934	1933	1932	1931	1930
Total	2.3	2.5	2.9	3.5	3.7	11.1	10.0	10.3	14.0	18.0
Alabama	4.8	4.3	4.9	6.9	7.9	20.6	18.7	15.4	20.6	31.2
California	1.4	1.5	1.3	1.6	1.7	9.1	8.4	8.2	11.5	14.8
Connecticut	.4	.5	.5	1.0	.9	5.1	4.7	4.2	7.8	10.5
District of Columbia	1.6	3.6	1.4	3.9	3.3	14.3	11.5	16.0	16.7	19.9
Georgia	10.6	8.4	12.6	16.7	16.4	22.1	16.7	13.2	18.8	24.8
Idaho	5.6	4.5	3.3	3.6	4.7	11.6	6.9	4.5	4.7	4.7
Illinois	1.7	1.4	1.7	1.5	1.9	8.3	6.4	6.9	3.9	5.9
Indiana	3.1	2.9	2.6	2.9	3.3	12.2	11.1	12.3	13.9	18.9
Iowa	2.2	1.0	1.7	1.4	1.6	6.9	4.0	4.5	7.6	6.6
Kansas	1.4	1.5	1.7	2.2	3.0	8.2	8.5	7.2	8.1	12.1
Louisiana	9.5	11.4	10.8	14.5	11.7	21.1	19.1	14.0	22.4	22.1
Maryland	2.4	2.2	3.1	5.4	6.4	17.3	15.1	19.6	31.3	30.0
Michigan	1.4	1.0	1.1	1.4	1.8	7.5	5.8	6.3	9.2	14.4
Minnesota	.5	.8	.7	.6	1.0	4.0	5.0	3.9	4.4	6.8
Mississippi	3.0	6.0	6.3	9.5	10.2	19.7	15.1	10.9	14.4	15.0
Montana	3.0	2.8	2.8	2.2	3.2	13.2	5.4	7.4	11.0	15.3
Nebraska	1.1	.7	1.4	1.7	1.6	5.4	4.7	4.9	7.1	8.3
New Jersey	.9	1.0	.7	1.0	1.1	5.3	4.3	5.6	9.1	11.5
New York	.6	.9	1.0	1.1	1.2	6.4	6.8	6.4	8.7	11.4
North Carolina	2.7	3.9	5.0	5.1	4.4	27.2	21.0	16.8	22.2	29.7
Ohio	1.7	1.7	2.0	2.4	3.3	7.6	8.1	9.2	11.7	16.4
Pennsylvania	1.1	1.2	1.8	2.1	2.6	8.3	8.6	12.3	17.5	22.5
Rhode Island	.7	.4	.3	1.0	1.6	4.0	4.2	8.0	8.6	10.3
South Dakota	2.3	5.0	1.4	2.7	2.9	9.2	8.1	6.4	11.4	11.0
Tennessee	7.5	9.1	11.0	10.7	12.2	26.4	24.0	20.4	23.4	28.6
Virginia	3.4	4.4	5.1	7.3	5.8	17.3	16.1	14.8	22.5	26.1
West Virginia	7.0	8.0	12.1	12.6	12.1	28.2	32.9	48.9	54.3	70.1
Wisconsin	.6	.5	.7	.7	.9	6.6	6.6	6.8	10.4	10.2
Hawaii	3.3	5.3	2.4	2.6	2.4	28.9	36.5	45.7	49.3	76.6
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over [1]	1.5	1.6	1.7	2.4	2.4	4.4	4.6	4.6	5.9	8.0

State	Measles (7)					Whooping cough (9)				
	1934	1933	1932	1931	1930	1934	1933	1932	1931	1930
Total	4.2	1.6	1.5	2.5	2.9	5.1	3.2	4.1	3.5	4.2
Alabama	11.7	1.0	.2	6.4	3.1	12.4	6.4	7.4	3.6	9.5
California	1.3	1.8	.9	1.9	5.2	2.7	3.2	2.9	2.4	3.5
Connecticut	.4	.5	1.1	2.3	.4	1.0	1.6	2.7	2.7	2.0
District of Columbia	9.7	.8	.2	2.4	.2	7.8	1.4	4.0	5.7	2.7
Georgia	18.1	2.1	.5	2.1	4.4	11.2	7.3	8.8	3.8	9.0
Idaho	3.6	.7	.2	1.8	2.0	3.3	.2	.7	6.3	4.3
Illinois	2.7	.7	.6	4.2	1.0	3.9	1.0	2.9	2.7	2.1
Indiana	6.8	.4	.4	4.5	1.9	5.7	2.1	5.0	4.3	3.0
Iowa	2.7	.2	.2	.1	8.1	3.8	2.6	2.0	2.4	3.7
Kansas	1.9	.7	1.3	.4	4.2	4.7	3.2	2.5	1.3	3.5
Louisiana	7.6	1.7	1.7	.6	4.7	10.2	5.6	4.0	5.4	5.9
Maryland	8.8	.2	1.1	5.9	.4	7.3	4.0	5.4	7.6	4.4
Michigan	.7	2.2	3.6	.6	4.7	2.8	8.0	3.9	3.7	3.6
Minnesota	1.5	2.7	.5	.3	3.3	4.2	2.9	1.7	2.1	2.6
Mississippi	13.9	2.7	.1	.4	1.4	14.1	10.1	4.9	3.4	6.9
Montana	5.4	2.6	2.2	.4	2.2	4.7	3.0	4.1	8.9	3.0
Nebraska	1.6	.6	.1	.3	6.2	5.9	2.0	1.9	4.0	2.6
New Jersey	1.2	1.7	1.0	2.4	3.2	1.5	1.0	2.9	3.3	2.2
New York	.6	2.5	1.0	1.8	1.9	1.7	2.2	2.3	2.9	2.8
North Carolina	9.5	2.6	1.8	3.2	.1	13.0	6.0	6.9	5.7	8.5
Ohio	2.1	1.7	2.4	2.1	2.8	4.4	2.3	4.9	2.4	3.0
Pennsylvania	2.6	1.2	2.1	4.2	2.3	3.2	1.9	4.4	3.1	3.9
Rhode Island	.4	(2)	6.0	1.4	.9	3.0	3.6	1.6	2.3	5.4
South Dakota	16.6	1.0	(2)	.3	3.0	7.8	6.3	6.3	5.7	2.7
Tennessee	16.3	2.9	.3	3.8	4.9	9.6	5.7	7.5	6.3	6.3
Virginia	6.2	2.1	.9	3.2	3.9	8.3	4.4	12.5	6.2	10.8
West Virginia	3.5	2.5	9.8	2.3	4.9	11.9	6.0	10.2	7.4	12.0
Wisconsin	2.2	.9	1.4	1.4	3.3	3.5	2.0	2.2	1.9	3.8
Hawaii	.3	.5	6.6	10.2	4.3	14.1	12.4	1.1	.3	3.5
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	2.3	1.3	1.4	2.6	2.3	1.7	1.0	1.4	1.7	1.9

[1] The Metropolitan Life Insurance Co. data for diarrhea and enteritis include adults as well as children under 2 years.
[2] No deaths.

TABLE 4.—*Death rates for various causes per 100,000 population*—Continued

State	Scarlet fever (8)					Diphtheria (10)				
	1934	1933	1932	1931	1930	1934	1933	1932	1931	1930
Total	2.0	2.0	2.1	2.1	1.9	2.7	2.9	3.8	4.1	4.6
Alabama	.5	.7	1.3	1.1	1.4	5.9	5.8	7.5	7.6	7.1
California	1.3	1.4	.9	.9	1.2	1.7	1.9	3.3	2.9	3.4
Connecticut	.8	1.4	1.1	.7	1.5	.4	1.0	1.0	.9	2.0
District of Columbia	1.6	2.6	2.6	1.0	2.3	3.0	2.8	3.2	7.1	3.7
Georgia	.5	.6	.6	1.5	1.3	6.2	6.2	5.7	5.0	4.5
Idaho	2.9	.2	1.9	2.2	2.0	2.9	1.8	3.1	2.5	3.1
Illinois	2.6	3.5	3.3	4.5	3.9	1.9	1.7	3.0	4.7	7.1
Indiana	3.6	2.7	2.7	3.6	2.1	3.6	4.5	5.2	4.1	4.1
Iowa	2.5	1.8	1.5	1.6	2.5	1.6	2.1	2.3	1.7	1.8
Kansas	1.8	2.1	1.7	1.2	2.4	2.2	2.9	3.9	3.7	3.6
Louisiana	.6	.5	.4	.7	.6	4.6	4.7	6.5	6.4	5.0
Maryland	1.5	2.3	1.9	1.9	2.1	1.3	1.7	3.1	4.0	3.4
Michigan	3.1	3.1	2.2	2.3	2.7	.8	2.2	2.1	3.5	6.2
Minnesota	1.2	1.4	1.6	.9	1.4	.7	1.0	.9	1.4	1.2
Mississippi	.7	.4	.6	.5	.6	4.1	5.4	6.2	9.9	6.8
Montana	2.0	1.9	1.5	1.9	2.8	1.9	3.0	.9	1.7	.7
Nebraska	1.7	1.7	2.0	1.5	2.2	1.6	1.5	4.0	3.5	3.3
New Jersey	1.5	1.4	1.7	2.0	1.5	1.3	1.2	2.3	2.9	8.2
New York	1.2	1.6	2.8	1.7	1.1	1.0	1.1	2.1	2.2	2.7
North Carolina	1.2	1.4	1.1	2.0	1.2	6.3	6.1	4.5	7.3	7.9
Ohio	3.3	3.2	3.3	3.3	2.6	2.9	2.5	3.3	2.8	2.8
Pennsylvania	2.3	2.7	2.6	2.3	1.9	2.2	2.3	4.0	3.6	5.2
Rhode Island	.6	1.3	3.5	1.7	1.0	.3	1.3	4.1	4.7	5.4
South Dakota	1.4	1.6	1.3	.6	.6	1.0	2.3	2.9	2.6	2.9
Tennessee	2.0	1.8	.8	2.4	1.6	7.6	8.2	8.2	9.3	6.6
Virginia	1.8	2.1	1.3	1.4	1.1	6.0	6.3	5.3	8.5	6.1
West Virginia	4.4	2.5	2.4	1.7	1.9	9.5	10.7	13.2	9.3	6.2
Wisconsin	1.8	1.2	1.5	2.1	3.0	.9	.6	1.9	1.8	2.4
Hawaii	([2])	([2])	.3	([2])	.3	.5	1.8	4.8	5.7	11.3
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	2.5	2.6	2.8	3.2	2.5	2.0	2.5	3.8	4.3	5.7

State	Poliomyelitis (16)					Meningococcus meningitis (18)				
	1934	1933	1932	1931	1930	1934	1933	1932	1931	1930
Total	0.6	0.6	0.7	1.0	1.1	0.8	1.0	1.3	2.1	3.1
Alabama	.6	.4	.2	.9	.8	.4	.4	.6	3.0	1.5
California	1.8	.2	.5	.8	2.8	.8	1.3	1.4	2.5	2.8
Connecticut	.1	.2	.4	5.5	1.1	.4	.5	.7	.7	.9
District of Columbia	.6	.4	1.2	.8	.6	1.0	2.2	2.6	5.7	2.0
Georgia	.8	.7	.9	1.2	1.1	.6	.4	.8	1.8	3.0
Idaho	3.3	.9	.2	.7	1.3	2.9	1.6	3.1	6.9	6.9
Illinois	.4	.4	.5	1.3	.7	1.5	2.7	2.0	3.2	2.4
Indiana	.7	.3	.2	.6	.7	.6	1.4	3.9	5.5	8.3
Iowa	.3	1.6	1.0	1.1	1.7	1.1	1.4	.9	2.6	3.3
Kansas	.6	.7	.6	.6	3.6	1.1	1.1	1.3	1.3	2.8
Louisiana	.4	.4	.5	.9	2.3	.6	1.2	1.2	2.3	3.6
Maryland	.3	.2	.3	.7	.4	.2	1.1	1.1	1.8	1.3
Michigan	.5	.1	.5	2.2	.8	.5	.6	1.3	2.4	7.5
Minnesota	.8	1.3	.5	2.4	1.6	.8	1.2	.9	1.6	1.9
Mississippi	.9	.3	.8	.4	.5	.7	1.0	1.0	1.5	6.9
Montana	3.2	.4	1.1	2.8	1.1	1.7	.6	1.3	2.2	4.1
Nebraska	.6	.3	.9	.9	3.4	1.3	.6	.5	1.6	2.5
New Jersey	.3	.6	1.1	3.5	.4	.5	.6	.8	1.8	1.8
New York	.3	1.1	.5	5.2	1.0	.6	.7	1.2	2.7	2.6
North Carolina	.4	.4	.5	.6	.4	.5	.3	.5	.6	.8
Ohio	.5	.8	.4	.8	1.6	.9	.5	.8	1.5	1.8
Pennsylvania	.3	.6	1.5	1.0	.5	.7	.9	1.3	1.9	2.2
Rhode Island	([2])	.1	.4	1.4	.1	.7	.4	.4	.9	.9
South Dakota	1.4	.9	1.1	2.3	1.6	.4	.1	.4	.3	.3
Tennessee	1.2	1.2	.6	.9	1.0	1.4	.9	1.4	4.3	9.6
Virginia	.7	.4	.7	.6	.8	1.5	1.0	1.1	1.8	2.3
West Virginia	1.0	1.2	.7	1.4	.6	2.1	.9	1.1	1.0	1.1
Wisconsin	.5	.4	.4	1.6	.9	.7	.5	.9	1.3	2.0
Hawaii	.3	.5	.8	.8	([2])	2.0	.8	2.9	2.3	4.3
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	.5	.6	1.0	2.6	1.1	------	------	------	------	------

[2] No deaths.

TABLE 4.—*Death rates for various causes per 100,000 population*—Continued

State	Influenza (11)					Pneumonia, all forms (107-109)				
	1934	1933	1932	1931	1930	1934	1933	1932	1931	1930
Total	15.2	23.7	27.5	24.8	18.5	78.2	69.3	77.1	81.7	83.0
Alabama	27.0	32.7	48.4	40.7	35.5	81.6	59.1	66.0	83.4	85.8
California	5.2	13.8	18.3	13.6	9.1	54.0	61.8	64.1	66.5	73.0
Connecticut	7.4	21.5	15.3	17.3	13.5	63.9	73.6	66.0	72.3	88.4
District of Columbia	7.6	9.9	15.5	18.1	8.2	131.6	115.6	135.5	140.3	122.1
Georgia	32.9	41.5	59.0	44.1	32.2	100.5	76.3	82.9	82.9	84.1
Idaho	14.7	18.7	21.0	9.2	11.2	102.7	72.8	76.7	76.5	104.0
Illinois	10.6	15.4	24.0	20.3	11.7	74.9	63.3	67.4	69.1	63.5
Indiana	22.5	31.1	44.0	35.0	21.0	85.9	69.1	90.6	86.2	80.9
Iowa	17.9	33.3	35.8	25.7	26.9	77.0	74.1	78.9	66.8	79.6
Kansas	19.2	45.9	41.6	30.0	29.3	58.1	53.4	53.5	51.5	54.2
Louisiana	20.1	32.4	52.4	42.1	39.9	72.6	64.1	75.5	81.4	91.5
Maryland	8.7	17.4	20.1	20.6	10.3	96.5	93.6	103.0	126.3	118.2
Michigan	10.5	17.0	22.2	16.5	11.9	67.8	54.4	63.3	57.6	68.2
Minnesota	14.6	24.5	30.8	21.8	15.9	81.3	58.9	68.8	69.1	71.1
Mississippi	24.9	34.8	40.5	37.5	29.3	63.9	49.6	48.3	56.3	60.9
Montana	26.4	35.8	41.6	32.7	22.9	81.6	63.3	63.6	70.3	80.2
Nebraska	17.4	34.5	36.9	21.8	17.7	73.2	70.0	62.0	54.3	64.0
New Jersey	7.3	12.3	14.0	13.6	8.9	66.2	71.3	61.3	78.0	77.7
New York	6.7	12.9	13.0	13.4	8.4	83.9	91.4	96.7	105.6	101.9
North Carolina	21.6	28.8	20.5	33.4	24.4	102.1	64.9	80.7	87.1	92.9
Ohio	17.3	22.9	34.1	28.8	19.4	75.8	60.6	76.8	77.9	74.6
Pennsylvania	15.1	25.1	29.3	28.1	19.8	79.9	69.7	81.5	97.2	92.4
Rhode Island	7.5	17.4	11.3	13.9	8.1	70.6	76.1	93.8	98.8	94.3
South Dakota	29.1	45.1	28.9	26.0	24.4	53.5	61.0	46.6	55.4	58.1
Tennessee	35.6	39.7	54.1	37.0	31.3	96.2	77.4	87.1	84.5	88.9
Virginia	27.0	37.1	37.3	47.2	29.4	79.1	66.6	71.5	80.6	83.7
West Virginia	26.6	33.7	46.9	33.8	27.8	79.7	64.6	78.3	82.5	91.5
Wisconsin	11.6	25.6	28.5	18.1	30.7	67.6	51.4	66.5	65.4	72.6
Hawaii	14.6	7.4	11.3	11.0	10.5	117.1	97.8	100.1	102.3	118.2
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	10.2	18.8	17.7	19.2	13.2	56.4	54.8	56.7	62.1	62.7

State	Tuberculosis, all forms (23-32)					Cancer (45-53)				
	1934	1933	1932	1931	1930	1934	1933	1932	1931	1930
Total	54.3	56.6	60.0	64.7	68.0	107.9	104.1	102.1	98.9	97.8
Alabama	63.3	69.1	77.2	86.3	86.0	55.9	55.9	55.5	54.3	53.8
California	74.9	76.4	81.0	88.9	98.3	129.4	127.0	120.2	124.2	125.7
Connecticut	42.5	47.2	49.0	53.6	59.2	128.0	121.4	121.5	114.0	117.1
District of Columbia	122.5	124.6	121.5	120.2	116.8	152.5	149.5	140.7	135.2	136.7
Georgia	59.2	59.9	65.5	72.9	73.4	58.7	55.0	52.2	52.7	52.2
Idaho	28.8	31.0	28.6	29.8	32.9	75.4	82.6	76.6	66.4	61.4
Illinois	52.1	53.4	54.1	59.1	59.6	122.4	117.7	114.4	112.7	112.0
Indiana	54.2	56.9	59.9	61.1	65.9	114.8	109.7	110.8	106.1	104.6
Iowa	24.9	25.7	28.2	28.5	33.1	125.9	123.0	116.5	112.9	110.8
Kansas	26.9	30.3	32.5	37.0	36.8	113.0	108.1	104.2	97.0	96.4
Louisiana	74.5	73.0	72.7	81.5	84.1	71.6	71.8	67.1	68.2	68.0
Maryland	78.1	81.5	90.4	95.7	98.9	124.3	117.5	116.0	111.6	111.5
Michigan	43.1	46.5	48.2	53.3	59.8	101.0	96.9	93.3	90.6	90.7
Minnesota	34.9	37.9	39.2	40.0	46.3	130.7	131.1	124.2	121.3	119.1
Mississippi	54.2	59.9	62.6	72.1	78.4	50.6	49.5	50.2	48.7	46.8
Montana	49.2	50.3	55.0	61.3	62.3	87.5	91.4	92.9	74.5	78.9
Nebraska	21.7	21.6	20.3	24.6	24.5	109.0	101.4	100.6	98.5	100.9
New Jersey	52.8	56.7	60.6	65.1	69.3	123.2	119.6	112.9	113.4	107.1
New York	56.1	59.1	61.3	66.4	71.0	130.6	128.1	124.1	123.8	122.7
North Carolina	63.4	64.3	65.5	69.4	74.7	51.1	50.0	46.2	48.2	47.9
Ohio	51.0	53.6	54.9	62.0	63.0	115.8	111.2	110.5	100.8	105.2
Pennsylvania	47.2	48.4	52.5	56.4	59.9	106.8	102.8	102.1	98.9	94.9
Rhode Island	43.6	49.5	52.4	61.9	69.3	129.5	134.3	140.7	132.6	135.7
South Dakota	33.8	38.3	45.1	43.7	48.6	84.3	82.4	80.7	82.7	72.9
Tennessee	88.4	93.8	101.4	107.2	116.5	64.2	60.0	56.8	57.1	58.2
Virginia	72.9	77.3	81.0	87.0	85.0	74.5	72.3	67.9	64.3	61.6
West Virginia	54.2	53.8	55.4	59.8	65.4	67.6	67.5	62.0	57.7	59.4
Wisconsin	37.1	40.7	44.9	48.1	50.5	122.1	116.4	116.4	115.8	112.8
Hawaii	81.6	99.6	94.3	98.2	102.3	60.6	68.6	71.5	57.2	59.6
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	59.6	65.1	70.2	76.7	81.3	97.3	95.9	93.4	85.4	79.5

TABLE 4.—*Death rates for various causes per 100,000 population*—Continued

State	Diabetes mellitus (59)					Cerebral hemorrhage, apoplexy (82, a, b)				
	1934	1933	1932	1931	1930	1934	1933	1932	1931	1930
Total	22.9	21.9	22.0	20.6	19.3	80.4	79.6	81.0	80.0	80.5
Alabama	10.8	9.6	10.5	10.5	8.8	62.1	56.7	61.8	61.4	65.5
California	21.5	22.6	20.8	19.2	18.1	77.4	82.6	77.8	78.6	81.9
Connecticut	25.9	24.6	25.1	21.9	17.9	------	------	------	------	------
District of Columbia	37.8	20.5	25.2	25.1	26.6	107.6	115.2	107.5	105.7	99.3
Georgia	13.0	11.7	11.6	10.9	11.6	76.6	72.6	80.0	84.8	90.1
Idaho	13.2	10.7	12.7	12.5	7.8	71.9	74.8	70.9	95.3	71.3
Illinois	27.7	26.1	26.3	25.6	22.1	71.1	72.4	73.0	73.0	74.7
Indiana	18.7	14.6	15.5	15.4	15.7	127.2	110.8	114.1	111.2	111.6
Iowa	21.9	19.5	16.0	19.8	21.0	110.4	112.1	109.0	111.2	95.8
Kansas	23.6	23.3	22.1	21.9	20.9	96.8	99.8	101.2	94.8	99.7
Louisiana	13.8	14.0	13.7	12.8	12.1	56.0	60.6	60.2	57.5	61.8
Maryland	23.3	23.6	25.7	23.0	21.3	102.1	103.0	112.6	108.6	105.1
Michigan	21.7	21.9	21.9	19.1	18.1	84.1	81.4	84.1	87.7	89.9
Minnesota	22.7	20.7	22.2	19.5	18.2	82.4	80.2	77.8	75.4	79.5
Mississippi	8.4	7.6	7.6	7.8	8.9	64.0	65.8	61.9	64.3	66.6
Montana	19.7	15.6	15.8	15.4	16.2	75.4	69.6	70.1	68.0	66.6
Nebraska	19.9	16.3	22.8	21.2	20.6	95.8	95.0	93.0	84.4	84.5
New Jersey	27.4	29.0	26.0	23.9	23.1	80.9	82.3	77.3	79.4	80.4
New York	30.8	30.4	29.9	28.2	26.9	48.6	52.4	51.5	52.0	53.2
North Carolina	11.4	10.7	10.7	10.6	10.0	------	------	------	------	------
Ohio	24.3	23.2	24.2	21.7	21.7	111.9	106.9	110.3	109.1	107.7
Pennsylvania	26.8	25.7	25.7	24.7	21.9	84.3	84.9	85.7	87.0	87.1
Rhode Island	32.0	34.0	32.0	20.4	27.8	88.5	96.9	104.9	98.0	94.6
South Dakota	22.1	19.6	17.3	20.6	16.9	72.8	78.2	67.0	64.1	61.3
Tennessee	11.0	10.6	10.1	10.6	10.8	78.3	66.7	65.6	60.0	62.9
Virginia	17.2	14.8	15.8	14.9	14.3	96.0	96.6	91.0	97.7	95.8
West Virginia	11.4	11.4	13.0	11.7	12.5	70.2	68.5	76.1	67.9	63.7
Wisconsin	24.0	23.6	22.4	22.4	20.7	85.2	85.0	87.3	85.9	85.6
Hawaii	16.6	15.8	9.5	12.3	13.0	38.9	49.7	51.8	50.7	48.3
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	24.7	24.4	23.3	21.4	18.7	64.0	64.5	62.9	61.3	61.3

State	Heart diseases (90–95)					Nephritis (130–132)				
	1934	1933	1932	1931	1930	1934	1933	1932	1931	1930
Total	243.9	225.9	219.9	212.1	210.0	83.3	81.2	83.8	83.1	87.4
Alabama	147.2	124.8	117.9	116.9	134.0	80.4	78.4	81.7	88.2	100.4
California	283.3	271.6	252.2	253.4	239.7	76.0	78.7	80.6	80.9	81.0
Connecticut	219.5	209.7	208.1	203.0	183.6	87.9	85.3	87.8	88.3	73.2
District of Columbia	301.3	312.2	330.6	300.2	315.9	126.2	128.9	140.4	140.2	160.4
Georgia	167.3	134.0	139.9	132.8	138.0	109.1	105.0	109.6	107.4	127.0
Idaho	158.3	161.8	161.2	159.7	174.6	36.2	35.3	43.3	38.7	39.2
Illinois	267.1	251.5	231.6	232.1	223.1	103.6	102.6	108.8	107.2	105.8
Indiana	271.2	185.8	183.2	175.8	190.0	77.4	76.1	73.2	74.8	80.4
Iowa	209.8	198.3	198.3	200.7	195.8	66.7	65.5	65.4	61.4	65.6
Kansas	203.6	194.0	178.0	153.9	171.5	94.7	93.9	100.0	95.3	102.7
Louisiana	182.5	188.0	182.5	178.0	199.1	107.9	95.9	102.5	108.6	112.0
Maryland	263.7	256.5	256.5	251.0	245.2	137.5	144.5	138.4	139.2	149.6
Michigan	230.6	226.8	217.9	204.4	229.6	60.7	59.6	57.8	58.8	63.7
Minnesota	214.2	198.3	193.6	177.9	173.4	52.0	54.8	54.7	50.8	52.2
Mississippi	95.9	97.0	84.2	94.3	104.3	83.4	69.6	76.3	95.4	97.1
Montana	177.3	178.8	158.7	130.6	139.4	70.2	68.7	71.4	66.7	73.1
Nebraska	180.5	175.9	171.4	159.1	159.4	59.3	57.3	72.0	67.9	58.6
New Jersey	285.8	269.0	231.0	234.3	232.1	82.9	86.0	91.0	96.3	102.2
New York	308.2	289.9	294.2	288.0	275.9	80.8	76.7	74.8	73.4	76.4
Ohio	246.9	236.8	237.5	220.3	225.3	79.9	76.9	78.6	74.0	78.4
Pennsylvania	262.9	244.8	238.4	233.5	231.6	89.6	92.6	93.0	92.7	104.3
Rhode Island	294.3	276.8	264.7	245.8	260.6	105.8	111.9	117.2	112.5	103.3
South Dakota	143.3	145.1	150.3	127.4	123.5	61.8	50.1	41.7	39.1	45.7
Tennessee	146.8	136.3	133.6	128.1	129.2	63.2	62.4	67.2	69.6	75.9
Virginia	219.1	192.5	198.3	188.3	178.2	93.0	89.2	119.5	101.5	108.3
West Virginia	125.4	117.0	113.0	110.6	116.6	65.5	78.6	68.8	64.5	61.3
Wisconsin	232.1	223.7	217.4	203.1	204.8	67.6	65.7	66.5	67.7	67.4
Hawaii	98.5	115.9	100.1	105.7	121.4	65.5	77.0	60.2	68.4	66.9
Industrial policyholders, Metropolitan Life Insurance Co.,[3] ages 1 and over	164.9	163.5	157.5	150.1	147.1	65.7	68.1	69.6	68.1	69.2

[3] Heart diseases in data or industrial policyholders exclude pericarditis, acute endocarditis, acute myocarditis, and angina pectoris; nephritis data for industrial policyholders include only chronic nephritis.

DEATHS DURING WEEK ENDED APRIL 6, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Apr. 6, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	8,614	9,063
Deaths per 1,000 population, annual basis	12.0	12.6
Deaths under 1 year of age	598	646
Deaths under 1 year of age per 1,000 estimated live births	55	60
Deaths per 1,000 population, annual basis, first 14 weeks of year	12.7	12.7
Data from industrial insurance companies:		
Policies in force	67,690,476	67,704,011
Number of death claims	13,806	14,547
Death claims per 1,000 policies in force, annual rate	10.6	11.2
Death claims per 1,000 policies, first 14 weeks of year, annual rate	10.8	11.1

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Apr. 13, 1935, and Apr. 14, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 13, 1935, and Apr. 14, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 13, 1935	Week ended Apr. 14, 1934	Week ended Apr. 13, 1935	Week ended Apr. 14, 1934	Week ended Apr. 13, 1935	Week ended Apr. 14, 1934	Week ended Apr. 13, 1935	Week ended Apr. 14, 1934
New England States:								
Maine	4	2		3	223	33	0	0
New Hampshire			3		7	164	0	0
Vermont	3				11	94	0	0
Massachusetts	7	20			530	2,257	0	2
Rhode Island					183	5	1	0
Connecticut	5	3	7	6	1,779	55	2	2
Middle Atlantic States:								
New York	20	60	[1] 5	[1] 11	2,957	1,260	9	0
New Jersey	27	12	7	13	1,488	673	0	2
Pennsylvania	49	68			4,818	5,469	10	3
East North Central States:								
Ohio	46	23	123	81	2,417	1,191	22	1
Indiana	11	26	30	30	284	1,130	3	3
Illinois	53	22	35	15	3,017	1,784	17	6
Michigan	6	13	2	1	5,420	179	0	0
Wisconsin	2	2	60	27	1,733	1,255	4	1
West North Central States:								
Minnesota	9	6	3	1	1,230	263	1	0
Iowa	16	12	2	10	679	350	8	3
Missouri	18	71	141	101	741	729	5	6
North Dakota	3	4	1	1	57	117	0	0
South Dakota	5	12	1		42	336	0	0
Nebraska	3	1	28		587	324	5	1
Kansas	13	9	5	1	1,619	359	2	1
South Atlantic States:								
Delaware		2		1	10	140	0	0
Maryland [2]	6	2	9	18	79	1,985	5	0
District of Columbia	16	11	1		50	329	4	0
Virginia	11	17			769	1,377	10	7
West Virginia	17	6	60	21	623	166	2	2
North Carolina	15	19	9	28	253	2,343	4	2
South Carolina	4	8	221	420	42	695	0	0
Georgia [3]	7	10	55			757	0	0
Florida	9	4	2	1	82	569	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 13, 1935, and Apr. 14, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 13, 1935	Week ended Apr. 14, 1934	Week ended Apr. 13, 1935	Week ended Apr. 14, 1934	Week ended Apr. 13, 1935	Week ended Apr. 14, 1934	Week ended Apr. 13, 1935	Week ended Apr. 14, 1934
East South Central States:								
Kentucky	11	16	21	20	672	341	7	1
Tennessee	10	12	68	80	82	702	4	3
Alabama [3]	9	17	76	48	286	811	3	0
Mississippi [2]	5	4					3	2
West South Central States:								
Arkansas	4	10	21	10	75	176	2	2
Louisiana	18	21	117	5	109	365	1	0
Oklahoma [4]	7	4	94	52	259	453	6	3
Texas [3]	36	78	250	350	270	1,605	7	1
Mountain States:								
Montana	7	1	42	217	439	109	0	0
Idaho [5]			4		17	96	0	0
Wyoming [5]					106	41	0	0
Colorado [5]	5	4			315	343	0	1
New Mexico	3	3	16	26	28	105	1	1
Arizona		3	38	2	21	71	0	0
Utah [4]				4	12	438	0	0
Pacific States:								
Washington	1	3	1		228	121	2	0
Oregon	2		35	43	232	142	4	0
California	20	36	57	35	1,645	688	9	2
Total	535	657	1,662	1,712	36,515	33,002	158	58
First 15 weeks of year	10,488	12,441	95,046	39,087	388,695	377,601	1,981	839

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 13, 1935	Week ended Apr. 14, 1934	Week ended Apr. 13, 1935	Week ended Apr. 14, 1934	Week ended Apr. 13, 1935	Week ended Apr. 14, 1934	Week ended Apr. 13, 1935	Week ended Apr. 14, 1934
New England States:								
Maine	0	0	18	30	0	0	7	3
New Hampshire	0	0	16	6	0	0	1	0
Vermont	0	0	9	8	0	0	0	0
Massachusetts	0	0	238	302	0	0	2	1
Rhode Island	0	0	13	12	0	0	0	0
Connecticut	0	0	105	64	0	0	1	1
Middle Atlantic States:								
New York	0	1	1,362	739	0	0	6	8
New Jersey	0	0	191	218	0	0	0	0
Pennsylvania	0	1	755	774	0	0	8	14
East North Central States:								
Ohio	0	1	895	981	2	1	4	2
Indiana	0	0	145	210	0	1	1	12
Illinois	1	2	1,397	570	2	5	9	6
Michigan	1	0	368	901	0	0	4	1
Wisconsin	2	1	477	216	20	22	2	0
West North Central States:								
Minnesota	1	0	301	69	6	6	0	0
Iowa	0	0	72	58	0	1	0	0
Missouri	0	0	41	80	0	7	1	3
North Dakota	0	0	76	67	3	0	0	1
South Dakota	0	0	14	11	14	15	0	0
Nebraska	1	1	36	28	44	18	0	0
Kansas	0	0	75	95	21	3	1	1
South Atlantic States:								
Delaware	0	0	17	8	0	0	0	2
Maryland [3]	1	0	125	91	0	0	3	2
District of Columbia	0	0	74	14	0	0	0	2
Virginia	0	0	46	35	0	0	3	3
West Virginia	0	0	97	72	0	0	14	3
North Carolina	1	2	22	22	1	1	1	0
South Carolina	0	0	6	4	0	1	3	5
Georgia [3]	0	0	8	15	0	0	7	8
Florida	0	0	3	6	0	0	0	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 13, 1935, and Apr. 14, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 13, 1935	Week ended Apr. 14, 1934	Week ended Apr. 13, 1935	Week ended Apr. 14, 1934	Week ended Apr. 13, 1935	Week ended Apr. 14, 1934	Week ended Apr. 13, 1935	Week ended Apr. 14, 1934
East South Central States:								
Kentucky	2	0	41	46	1	1	10	4
Tennessee	0	1	33	31	0	0	8	3
Alabama [3]	0	0	7	6	5	0	3	8
Mississippi [2]	1	0	7	6	0	6	6	2
West South Central States:								
Arkansas	0	0	1	4	0	3	0	2
Louisiana	1	0	7	17	1	0	22	13
Oklahoma [4]	0	0	8	7	0	1	2	8
Texas [3]	1	1	85	86	10	24	6	10
Mountain States:								
Montana	0	0	10	5	0	1	0	0
Idaho [5]	0	1	11	2	0	2	0	0
Wyoming [5]	1	0	4	5	7	7	0	0
Colorado [5]	0	0	215	27	4	6	1	1
New Mexico	0	0	5	9	5	0	0	1
Arizona	0	0	24	15	0	0	0	0
Utah [2]	0	0	95	10	0	2	0	0
Pacific States:								
Washington	2	1	56	50	15	5	1	2
Oregon	0	1	54	26	4	4	3	3
California	6	6	234	212	4	1	4	6
Total	22	20	7,905	6,273	169	144	144	112
First 15 weeks of year	378	306	107,855	91,070	2,918	2,201	1,910	2,228

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Apr. 13, 1935, 9 cases, as follows: Georgia, 5; Alabama, 1; Texas, 3.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Rocky Mountain spotted fever; week ended Apr. 13, 1935, 6 cases, as follows: Idaho, 1; Wyoming, 1; Colorado, 4.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
March 1935										
California	34	170	767	7	4,897	7	32	1,197	21	21
District of Columbia	47	84	15		215		1	453	0	0
Florida	2	27	93	14	261	3	0	20	12	10
Georgia	3	41	1,128	131	101	37	1	38	7	13
Iowa	8	40	69		5,509		1	367	9	15
Massachusetts	9	29			1,874	1	1	1,067	0	6
New Hampshire	1		19				0	73	0	0
New Mexico	11	22	70	4	105	2	0	57	11	17
North Carolina	12	55	244		2,354	53	4	153	0	7
Vermont		2			37		0	111	0	1

March 1935

	Cases
Actinomycosis:	
California	2
Botulism:	
California	1
Chicken pox:	
California	4,251
District of Columbia	327
Florida	595
Georgia	502
Iowa	233
Massachusetts	1,148
New Mexico	114
North Carolina	691
Vermont	79
Dengue:	
Florida	12
Dysentery:	
California (amoebic)	19
California (bacillary)	4
Florida (amoebic)	1
Georgia (amoebic)	3
Georgia (bacillary)	2
Massachusetts (amoebic)	2
Massachusetts (bacillary)	4
New Mexico (amoebic)	1
Epidemic encephalitis:	
Massachusetts	2
Food poisoning:	
California	7
German measles:	
California	2,332
Iowa	71
Massachusetts	5,120
New Mexico	190
North Carolina	131
Vermont	411
Granuloma, coccidioidal:	
California	3

March 1935

	Cases
Hookworm disease:	
Massachusetts	1
Georgia	2,858
Jaundice, epidemic:	
California	2
Lead poisoning:	
Massachusetts	12
Leprosy:	
California	1
Mumps:	
California	1,363
Florida	169
Georgia	284
Iowa	689
Massachusetts	532
New Mexico	197
Vermont	17
Ophthalmia neonatorum:	
California	1
Massachusetts	106
New Mexico	1
North Carolina	2
Paratyphoid fever:	
California	3
Iowa	1
Massachusetts	1
Puerperal septicemia:	
New Mexico	3
Rabies in animals:	
California	98
Massachusetts	54
Rabies in man:	
Massachusetts	1
Scabies:	
Iowa	1
Septic sore throat:	
California	5
Georgia	35
Massachusetts	38

March 1935

	Cases
Septic sore throat—Con.	
New Mexico	3
North Carolina	3
Tetanus:	
California	6
Georgia	1
Trachoma:	
California	8
Massachusetts	3
North Carolina	2
Trichinosis:	
California	8
Massachusetts	4
Tularaemia:	
California	1
Georgia	9
Typhus fever:	
Florida	1
Georgia	8
North Carolina	7
Undulant fever:	
California	11
Florida	1
Georgia	5
Iowa	7
Massachusetts	2
North Carolina	3
Vermont	5
Vincent's infection:	
Iowa	1
Whooping cough:	
California	676
Florida	56
Georgia	81
Iowa	60
Massachusetts	777
New Mexico	145
North Carolina	1,679
Vermont	193

CASES OF VENEREAL DISEASES REPORTED FOR FEBRUARY 1935

This statement is published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State health officers. They are preliminary and are, therefore, subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama	351	1.30	82	0.30
Arizona	51	1.13	150	3.31
Arkansas	345	1.84	153	.82
California	1,488	2.45	1,128	1.86
Colorado [1]				
Connecticut	192	1.17	117	.71
Delaware	158	6.56	28	1.16
District of Columbia	135	2.73	79	1.60
Florida	498	3.20	180	1.16
Georgia	936	3.42	545	1.87
Idaho	0		0	
Illinois	1,160	1.48	1,023	1.31
Indiana	311	.95	112	.34
Iowa [2]	122	.40	154	.62
Kansas	79	.42	72	.38
Kentucky	212	.80	274	1.03
Louisiana	213	.99	114	.67
Maine	42	.52	35	.44
Maryland	785	4.72	152	.91
Massachusetts	379	.88	360	.83
Michigan	523	1.04	466	.92
Minnesota	269	1.15	213	.94
Mississippi	1,089	5.23	1,767	8.63
Missouri	775	2.11	268	.73
Montana [2]	31	.58	43	.80
Nebraska	33	.24	69	.50
Nevada [1]				

See footnotes at end of table.

CASES OF VENEREAL DISEASES REPORTED FOR FEBRUARY 1935—Continued

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
New Hampshire	5	.11	20	.43
New Jersey [3]				
New Mexico [2]	40	.92	28	.65
New York [2]	1,311	1.01	569	.44
North Carolina	927	2.83	252	.77
North Dakota [3]				
Ohio [2]	532	.78	196	.29
Oklahoma [2]	195	.94	170	.82
Oregon	101	1.03	64	.65
Pennsylvania	288	.29	193	.20
Rhode Island	64	.91	58	.83
South Carolina [2]	226	1.29	365	2.09
South Dakota	6	.09	42	.60
Tennessee [1]	449	1.69	265	.99
Texas	841	1.40	206	.34
Utah [1]				
Vermont	21	.58	19	.53
Virginia	360	1.47	232	.95
Washington	191	1.19	147	.92
West Virginia [3]				
Wisconsin [4]	29	.10	127	.42
Wyoming [1]				
Total	15,833	1.36	10,615	.91

[1] Not reporting.
[2] Incomplete.
[3] Has been reporting regularly but no report received for current month.
[4] Only cases of syphilis in the infectious stage are reported.

NOTE.—Surveys in which all medical sources have been contacted in representative communities throughout the United States have revealed that the monthly rate per 10,000 population is 6.6 for syphilis and 10.2 for gonorrhea.

WEEKLY REPORTS FROM CITIES

City reports for week ended Apr. 6, 1935

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Maine:											
Portland	0	1	0	0	1	3	0	0	3	1	26
New Hampshire:											
Concord	0		0	0	0	2	0	1	0	0	18
Nashua	0			1		1	0		0	0	
Vermont:											
Barre	0		0	0	2	0	0	0	0	4	2
Burlington	0		0	46	0	3	0	0	0	0	8
Massachusetts:											
Boston	0		2	42	27	51	0	9	0	19	240
Fall River	1		0	20	7	4	0	0	0	5	35
Springfield	0		0	220	0	17	0	1	0	9	34
Worcester	0		0	3	7	19	0	3	0	10	53
Rhode Island:											
Pawtucket	0		0	1	0	1	0	0	0	0	16
Providence	2		0	185	2	0	0	3	0	7	53
Connecticut:											
Bridgeport	1		5	7	5	11	0	1	0	0	42
Hartford	0		0	35	4	16	0	1	0	2	61
New Haven	0		0	604	6	1	0	0	0	0	30
New York:											
Buffalo	0		0	170	14	52	0	6	0	19	124
New York	34	7	7	1,457	147	829	0	84	2	284	1,540
Rochester	0		0	244	3	17	0	1	0	15	70
Syracuse	0		0	396	7	6	0	1	0	9	58

City reports for week ended Apr. 6, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
New Jersey:											
Camden	14	2	1	1	3	10	0	0	0	1	27
Newark	0	1	1	315	9	12	0	7	0	69	103
Trenton	0	2	0	23	0	6	0	5	0	0	35
Pennsylvania:											
Philadelphia	3	9	5	30	38	134	0	28	0	60	506
Pittsburgh	6	6	3	748	21	51	0	8	0	15	163
Reading	0	-	0	36	0	0	0	1	0	1	23
Scranton	0	-	-	92	-	5	0	-	0	0	-
Ohio:											
Cincinnati	3	-	2	3	14	28	0	10	0	4	156
Cleveland	9	48	1	509	21	46	0	11	0	40	201
Columbus	4	3	3	81	7	40	0	3	0	1	93
Toledo	0	1	1	105	9	9	0	4	0	18	70
Indiana:											
Fort Wayne	0	-	0	0	1	2	0	0	0	3	23
Indianapolis	3	-	0	30	13	24	0	4	0	13	93
South Bend	0	-	0	0	2	8	0	0	0	0	18
Terre Haute	0	-	0	0	0	0	0	0	0	0	19
Illinois:											
Chicago	19	4	4	1,705	50	713	0	38	0	86	709
Springfield	2	-	0	19	2	12	0	1	0	2	21
Michigan:											
Detroit	8	-	3	2,775	37	167	0	24	3	115	314
Flint	3	-	0	122	7	22	0	0	0	0	27
Grand Rapids	0	-	0	214	1	12	0	0	0	16	23
Wisconsin:											
Kenosha	0	-	0	135	0	15	0	0	0	8	10
Milwaukee	3	-	0	252	7	145	0	2	1	47	90
Racine	0	1	1	68	0	20	0	0	0	10	10
Superior	0	-	0	121	0	0	0	0	0	0	4
Minnesota:											
Duluth	0	-	0	0	4	0	0	1	0	0	17
Minneapolis	2	-	1	539	12	118	0	2	0	47	121
St. Paul	1	-	0	12	15	46	2	2	0	15	65
Iowa:											
Davenport	1	-	-	0	-	3	0	-	0	0	-
Des Moines	1	-	-	1,453	-	2	0	-	0	0	33
Sioux City	2	-	-	6	-	0	0	-	0	7	-
Waterloo	7	-	-	4	-	6	0	-	0	0	-
Missouri:											
Kansas City	1	-	0	177	5	11	0	2	0	1	109
St. Joseph	1	-	0	3	6	0	0	2	0	0	29
St. Louis	6	1	0	35	10	16	0	5	2	2	207
North Dakota:											
Fargo	0	-	0	-	0	17	0	0	0	6	3
Grand Forks	0	-	-	-	-	2	0	-	0	0	-
South Dakota:											
Aberdeen	0	-	-	12	-	0	0	-	0	0	-
Nebraska:											
Omaha	4	-	0	56	10	7	1	2	0	2	52
Kansas:											
Topeka	-	-	-	-	-	-	-	-	-	-	-
Wichita	0	-	0	509	1	0	0	0	0	3	20
Delaware:											
Wilmington	2	-	0	18	4	11	0	0	0	0	28
Maryland:											
Baltimore	1	-	2	15	31	67	0	17	0	27	221
Cumberland	1	-	0	11	0	3	0	0	0	0	10
Frederick	0	-	0	0	0	0	0	0	0	0	7
District of Columbia											
Washington	18	5	1	72	27	113	0	11	0	2	186
Virginia:											
Lynchburg	1	-	0	56	1	1	0	0	0	26	12
Norfolk	0	-	0	25	3	3	0	0	0	4	32
Richmond	0	-	0	134	1	10	0	3	0	0	47
Roanoke	0	-	0	28	0	0	0	2	0	0	24
West Virginia:											
Charleston	0	-	0	15	1	3	0	0	1	6	11
Huntington	0	-	-	8	-	7	0	-	0	0	-
Wheeling	0	-	0	109	2	14	0	0	0	7	19
North Carolina:											
Raleigh	3	-	0	4	4	0	0	1	0	3	10
Wilmington	0	-	0	0	0	1	0	1	0	0	8
Winston-Salem	0	1	1	0	3	1	0	2	0	28	13

City reports for week ended Apr. 6, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
South Carolina:											
Charleston	0	12	0	0	1	1	0	1	0	0	19
Columbia	0	------	0	0	3	0	0	0	0	0	10
Greenville	0	------	0	0	4	1	0	0	0	0	12
Georgia:											
Atlanta	0	9	1	1	9	3	0	4	0	8	83
Brunswick	0	------	0	0	0	0	0	0	0	0	4
Savannah	1	9	0	0	3	0	0	2	3	0	25
Florida:											
Miami	0	------	2	1	1	2	0	1	0	0	24
Tampa	2	------	0	44	1	1	0	0	0	5	32
Kentucky:											
Ashland	0	------	------	4	------	0	0	------	0	0	------
Lexington	1	------	0	5	1	0	0	2	0	4	17
Louisville	2	3	0	512	10	16	10	3	0	29	79
Tennessee:											
Memphis	2	------	4	0	9	9	0	7	0	14	87
Nashville	2	------	1	3	5	7	0	1	0	0	32
Alabama:											
Birmingham	2	4	2	70	11	4	0	4	0	3	74
Mobile	0	------	1	3	2	1	0	2	0	0	21
Montgomery	0	1	------	18	------	0	0	------	1	2	------
Arkansas:											
Fort Smith	------	------	------	------	------	------	------	------	------	------	------
Little Rock	2	------	1	39	8	0	0	1	0	3	11
Louisiana:											
New Orleans	9	7	1	35	10	5	0	21	1	1	143
Shreveport	0	------	0	1	6	1	0	1	1	2	25
Oklahoma:											
Oklahoma City	0	5	1	10	4	1	0	0	0	0	40
Tulsa	0	------	------	0	------	1	0	------	0	7	------
Texas:											
Dallas	3	2	2	------	5	2	0	5	0	1	56
Fort Worth	0	------	3	------	3	1	0	1	0	0	43
Galveston	0	------	0	2	0	0	0	1	0	0	11
Houston	6	------	2	3	3	3	2	4	0	0	66
San Antonio	2	------	4	0	11	1	0	4	0	0	65
Montana:											
Billings	1	------	0	3	0	0	0	0	0	0	16
Great Falls	0	------	0	60	4	0	0	1	0	0	11
Helena	0	------	0	10	1	0	0	0	0	7	3
Missoula	0	------	0	100	1	0	0	0	0	0	4
Idaho:											
Boise	0	------	0	3	0	2	0	0	0	0	4
Colorado:											
Denver	2	53	1	208	12	197	2	5	0	14	86
Pueblo	0	------	1	118	3	13	0	1	0	16	11
New Mexico:											
Albuquerque	0	------	0	2	0	1	0	6	0	2	16
Utah:											
Salt Lake City	0	------	0	5	3	87	0	2	0	83	35
Nevada:											
Reno	0	------	0	1	1	1	0	0	0	0	2
Washington:											
Seattle	0	------	0	103	4	21	5	5	0	9	99
Spokane	0	1	1	108	0	4	0	1	0	2	26
Tacoma	0	------	0	0	5	3	3	2	0	0	38
Oregon:											
Portland	0	------	0	146	2	11	1	1	0	2	77
Salem	0	1	------	2	------	1	0	------	0	4	------
California:											
Los Angeles	10	35	2	44	17	49	3	19	0	26	333
Sacramento	1	------	0	70	1	19	0	0	1	0	22
San Francisco	0	------	0	33	9	23	0	9	0	11	165

City reports for week ended Apr. 6, 1935—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths	
Massachusetts:			
Worcester	0	1	0
Rhode Island:			
Providence	0	1	0
New York:			
New York	26	11	0
Rochester	0	1	0
Pennsylvania:			
Pittsburgh	2	0	0
Reading	1	0	0
Ohio:			
Cincinnati	3	4	0
Cleveland	1	0	1
Columbus	4	2	0
Indiana:			
Indianapolis	1	0	0
Terre Haute	1	1	0
Illinois.			
Chicago	16	3	0
Michigan:			
Detroit	0	2	0
Wisconsin:			
Milwaukee	3	1	0
Minnesota:			
Minneapolis	1	1	0
Iowa:			
Davenport	1	0	0
Des Moines	2	0	0
Sioux City	1	0	0
Missouri:			
Kansas City	1	2	0
St. Louis	5	0	0
Nebraska:			
Omaha	1	1	0
Maryland:			
Baltimore	2	1	0
District of Columbia:			
Washington	10	3	1
West Virginia:			
Huntington	1	0	0
South Carolina:			
Charleston	1	1	0
Florida:			
Miami	1	0	0
Kentucky:			
Louisville	1	0	0
Tennessee:			
Nashville	1	0	0
Alabama:			
Birmingham	1	0	0
Oklahoma:			
Tulsa	1	0	0
Texas:			
Dallas	1	0	0
Montana:			
Billings	1	0	0
Colorado:			
Denver	1	0	0
Pueblo	3	0	0
New Mexico:			
Albuquerque	1	0	0
Washington:			
Seattle	1	0	0
Oregon:			
Portland	2	3	0
California:			
Los Angeles	5	0	3

Dengue.—Miami, 1 case.

Epidemic encephalitis.—Cases: New York, 1; Pittsburgh, 1; Detroit, 1; Kansas City, Mo., 1; St. Louis, 1; Nashville, 1.

Pellagra.—Cases: Wilmington, N. C., 2; Winston-Salem, 1; Charleston, S. C., 4; Atlanta, 1; Tampa, 1; San Francisco, 2.

Typhus fever.—Atlanta, 2 cases.

FOREIGN AND INSULAR

ARGENTINA

Poliomyelitis.—According to a report dated March 29, 1935, there was an outbreak of poliomyelitis in Concordia, Entre Rios Province, Argentina. Cases of the disease had also been reported in Santa Fe, Cordoba, El Chaco, and Corrientes Provinces. The National Department of Health had received official notification of 28 cases of the disease, with 2 deaths.

ITALY

Communicable diseases—4 weeks ended November 11, 1934.—During the 4 weeks ended November 11, 1934, certain communicable diseases were reported in Italy, as follows:

Disease	Oct. 15-21		Oct. 22-28		Oct. 29-Nov. 4		Nov. 5-11	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	30	25	30	22	22	20	17	16
Cerebrospinal meningitis	8	6	6	3	8	4	8	7
Chicken pox	104	44	134	54	134	65	329	102
Diphtheria and croup	802	389	915	425	723	369	797	395
Dysentery	33	17	34	21	17	11	20	15
Lethargic encephalitis			2	2	2	2	1	1
Measles	800	189	1,285	204	1,104	200	1,467	230
Poliomyelitis	22	20	25	19	18	16	17	15
Scarlet fever	573	190	552	205	505	210	601	183
Typhoid fever	1,213	533	1,020	493	852	445	847	431

VIRGIN ISLANDS

Notifiable diseases—January-March 1935.—During the months of January, February, and March 1935, cases of certain notifiable diseases were reported in the Virgin Islands, as follows:

Disease	January	February	March	Disease	January	February	March
Filariasis	11	5	2	Sprue		1	3
Gonorrhea	3	4	7	Syphilis	4	21	22
Hookworm disease		2	3	Tetanus		1	1
Malaria	7	1		Tuberculosis	5	4	4
Pellagra	2	1	1				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following table must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Week ended— January 1935: 5	12	19	26	February 1935: 2	9	16	23	March 1935: 2	9	16	23	30
Ceylon:																		
Colombo	C											16	6	4	1			
	D											12	5	3				
Peliyagoda	C											10	12					
	D											6	11					
India	C	53,096	19,160	16,176	17,836	4,425	3,772	4,043	4,131	3,643	3,428	3,721						
	D	26,643	9,524	8,559	8,452	2,284	2,005	2,090	2,203	1,949	1,828	1,987						
Assam	C		43	327	645													
	D			133	274													
Bassein	C				15	2	2	2	2	1	1	2	2	3				1
	D				9	2	3	1	3		1	2	1	1	1			
Bombay Presidency	C	5,974	1,973	872	592	26	28	21	15	19	18	25	88	51				
	D	2,355	925	383	256	16	12	13	4	8	7	12	32	22				
Bombay	C	2													6			
Calcutta	C	183	110	78	166	53	30	30	61	96	151		197	154	186	154	157	187
Chittagong	C	1	1	1	12							2	2	3	3			9
Madras Presidency	C	3,647	1,098	1,901	5,157	1,394	1,553	2,109	2,637	2,142	1,696	1,330						
	D	1,695	526	895	2,469	705	911	1,114	1,385	1,116	866	728						
Madras	C	60	7	59	28	2	5	9	9	3	2	1		1		1	1	
	D	29	5	32	12	1	5	4	7	1	1	1					1	
Porto Novo	C				P													
Moulmein	C								1	7		11	8	4	2		[1] 2	
Negapatam	C			1			12				1		1	1	2		9	2
Punjab	C	35																
	D	25																
Rangoon	C	1			1		2	1	18	10	7	10	7		2	3	3	[1] 1
Tuticorin	C							1										[1] 1
Vizagapatam	C	6																
India (French):																		
Chandernagor	D	1	1											1				
Karikal	C	47	5	2	11	11	15	2	27	15	2	9	2	5				
Pondichery	C	59		10	29	4	6	19	21	4	4	13	6	2				

Indo-China (see also table below):																		
Kandal	C						2											
Pnom-Penh	C				2						1							1
Siam:																		
Bangkok	C														1			
Nagara Rajsima—Roy Ech	C													13				
	D													2				
On vessels:																		
S. S. *Aronda* at Rangoon from Calcutta	C	1																
S. S. *Ellenga* at Rangoon from Calcutta	C					1												
S. S. *Tilawa* at Cocanada	C										[2] 1							
S. S. *Egra* at Rangoon	C								[2] 1									
S. S. *Santhia* at Rangoon from Calcutta	C												1					
S. S. *Incomati* at Colombo	C															1		
	D															1		

[1] Imported.
[2] Suspected.

Place		October 1934			November 1934			December 1934			January 1935			February 1935	
		1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20
Indo-China (French) (see also table above):															
Cambodia [3]	C	1			3								2	1	3
	D	1			3								2	1	3
Cochin-China [3]	C				1	2						1			2
	D				1	2						1			1

[3] Reports incomplete.

PLAGUE[1]

[C indicates cases; D, deaths; P, present]

Place		Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Week ended— January 1935: 5	Jan. 12	Jan. 19	Jan. 26	February 1935: 2	Feb. 9	Feb. 16	Feb. 23	March 1935: 2	Mar. 9	Mar. 16	Mar. 23	Mar. 30
Argentina (see also table below): Santiago de Estero Province—Frias	C				1													
Azores. (See table below.)																		
Belgian Congo	C			14		1	2	1									P	
Bolivia: Tomina Province.[2]																		
Brazil:																		
Alagoas State	C				5													
	D				2													
Ceara State	C				2													
British East Africa (see also table below):																		
Kenya	C	13	1	5	4	17												
Uganda	C	70	89	79	122	17	14	26	22	9	16	10	15	4	11			
	D	69	85	75	114	17	12	25	22	9	16	10	14	4	11			
Canary Islands: Las Palmas	C							1										
Ceylon: Colombo	C	1		2	1					1	1			2	2	1		
	D			2	1						2			2	2			
Plague-infected rats		1		3												4		
China (see also table below):																		
Amoy	C													1				
Kangping:[3]																		
Manchuria:[4]																		
Mansantun[5]	D				4													
Dutch East Indies:																		
Cheribon	C												[6] 1					
Java—Batavia	C		5															
	D		5															
West Java	C	2,201	1,684	1,658	2,905	737	542	511	635									
	D	2,201	1,684	1,658	2,900	737	542	512	634									
Ecuador:																		
Celica	C											[7] 16						
Pungala and Tixan (near)	C											[7] 14						
Egypt:																		
Alexandria—Plague-infected rats		P	P	P	P	P		P		P		P		P				
Asyut	C			2										1				2
Beni-Suef	C			1														
Girga	C								1	1								1

Hawaii Territory:																		
Hawaii Island—Hamakua district—																		
Kalopa—Plague-infected rats			1	3														
Paauhau	C			1													1	
	D			1														1
Plague-infected rats			1															2
Pohakea—Plague-infected rats			1															
Maui Island—Makawao district—																		
Kahului (9-10 miles from)—Plague-infected rats			2												1	1		
Paia—Plague-infected rats			1															
India	C	6,640	5,642	4,167	4,549	2,159	1,212	1,071	1,410	1,279	1,545	1,623						
	D	3,981	3,114	2,424	2,875	1,300	649	721	833	706	945	851						
Bassein	C	1	2	3	1						1					2	2	2
Plague-infected rats		3	1												1			
Bombay Presidency	C	2,929	2,759	2,093	1,331	232	300	251	291	360	262	266	345	209				
	D	1,760	1,626	1,109	823	138	165	148	152	179	129	167	211	114				
Bombay	C	1						1										
Plague-infected rats		2	1															
Madras Presidency	C	553	309	230	258	60	58	79	40	65	38	39						
	D	296	183	92	127	20	31	35	33	35	16	30						
Moulmein	C														[6] 1			
	D														[6] 1			
Northwest Frontier Province	C															15		
	D															7		
Punjab	C		29	53	59	9	5	11	7	14	18	85	30	74	37	51	62	
	D		17	35	45	5	2	5	7	9	10	25	17	39	18	33	27	
Rangoon	C	3				1					[6] 1					1		
Plague-infected rats					1											1		
Indo-China (see also table below):																		
Bentre	C													1				
Kandal	C						1											
Pnom-Penh	C	3	2	1	2													
Saigon and Cholon	C	1		2														
Madagascar. (See table below.)																		
Morocco:																		
Safi Region	C																	9
	D																	5
Tangier	C			7														
Peru. (See table below.)																		
Senegal. (See table below.)																		

[1] Including plague in the United States and its possessions.

[2] During the months of January and February 1935, 8 cases of plague were reported at Tomina Province, Bolivia.

[3] A report dated Jan. 29, 1935, states that up to Jan. 23, 79 cases of plague with 78 deaths were reported near Kangping, China; the report also states that up to Jan. 21, 50 deaths from plague were reported in 6 villages of the Pe Wang Fu District, northwest of Kangping.

[4] A report dated Oct. 30, 1934, states that from June to Oct. 25, 1934, deaths from plague had been reported in Manchuria, China, as follows: Fengtien Province—Liaoyuan 30, Shuangshan 21, Tungliao 41, Kirin Province—Changling 12, Chienan 26, Fuyu 32, Hsinking City 1, Nungan 168.

[5] Up to Jan. 5, 1935, 44 cases of plague with 35 deaths were reported at Mansantun, Manchuria, China.

[6] Imported.

[7] For 2 weeks.

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Week ended— January 1935: 5	12	19	26	February 1935: 2	9	16	23	March 1935: 2	9	16	23	30
Siam:																		
Prachin—Nagara Nayok	C				4													
Nagara Rajsima	C											1						
Rajpuri	C					1								1				
South-West Africa.[8]																		
Tunisia: Tunis—Plague-infected rats													1					
Union of South Africa:																		
Cape Province	C								3	3								
Orange Free State	C		3	3	3					[9] 39								
On vessel: S. S. *Barjora* at Rangoon from Moulmein	C	1																
	D	1																

Place		September 1934	October 1934	November 1934	December 1934	January 1935	February 1935
Argentina (see also table above)	C	11					
Santa Fe	C						1
Azores	C	2		1	1	2	
British East Africa (see also table above):							
Kenya	C	5	1	6			
Uganda	C	54					
China: Kwangchowan	C			3			
	D			3			
Indo-China (see also table above):							
Cambodia	D	3	4	4	2	1	
Cochin-China	C	1		2			

Place		September 1934	October 1934	November 1934	December 1934	January 1935	February 1935
Madagascar (central region)	C	291	444	431	381		
	D	283	422	410	364		
Peru	C			2	5	5	
Lima department	C	2	3	1	1	1	
Senegal.							
Dakar [10]	C	17	13	4	2	2	1
	D	19	11	3	2	2	1
Diourbel [10]	C	1					
	D	1					
Rufisque [10]	C	18	8	4		1	
Theis [10]	C	6	6				
Tivaouane [10]	C	26	21	3	1		

[8] From January to Oct. 31, 1934, 33 cases of plague were reported in Ovamboland, South-West Africa.

[9] For 4 weeks.

[10] Reports incomplete.

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Week ended— January 1935: 5	12	19	26	February 1935: 2	9	16	23	March 1935: 2	9	16	23	30
Algeria:																		
Algiers Department	C		1								1							
Constantine Department	C	1	1															
Angola. (See table below.)																		
Belgian Congo (see also table below)	C	5		102					5									
Bolivia. (See table below.)																		
Brazil:																		
Porto Alegre (alastrim)	C	2	1															
Recife	C				1													
Sergipe State	C			P														
British East Africa:																		
Kenya	C	116	30	17	13													
Tanganyika	C	43	18	14	63				2			3						
British Somaliland	C	7	7	5					8	11		10	8	2	2			
British South Africa:																		
Northern Rhodesia	C	16										25						
Southern Rhodesia	C	1	2		1													
Canada:																		
Alberta	C			2	1													
Manitoba	C	[1] 1	[1] 1															
Ontario	C										[1] 1		[1] 1					
Saskatchewan	C		2	1														
Canary Islands: Santa Cruz de Tenerife	C				3													
Ceylon: [2]																		
Colombo	C	17	3	11	12	1	1	10	3	1								
Galle	C															10		
China:																		
Amoy	C			1		1									1			
Canton	C			3	9	1	3	2	1	3	1	2		2	1			
Dairen	C	2			2		4				1							
Foochow	C	P	P	P	P		P		P		P		P		P			
Hankow	C	1	1	1	16	10	5	4		10	2	1	2	2	2			
Hong Kong	C	1		2	2	1	2	1	4	1	5	2	1	6	3	2	1	2

[1] For 2 weeks.
[2] A report dated Mar. 7, 1935, states that from Jan. 31, 1935, 20 cases of smallpox were reported at Welitara, Ceylon.

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Week ended— January 1935: 5	12	19	26	February 1935: 2	9	16	23	March 1935: 2	9	16	23	30
China—Continued.																		
Macao	D			3	43	12	17	13	5	12	12	20	9	7	8	5	1	2
Nanking	C				1			1		1					1			
Shanghai	C	1	2	1	8					2	1		1	1			1	3
Swatow	C											1						
Tientsin	C		2	3	7	1	2	2	1	3		6	2	2				
Tsingtao	C		1	3	2		9	1	1		6	11		3				
Chosen. (See table below.)																		
Colombia	C						[1] 11			20	1		2		5			
Dahomey. (See table below.)																		
Dutch East Indies: Balei	C								4									
Ecuador. (See table below.)																		
Egypt:																		
Cairo	C	1																
Dakahliya	C									56	18	13		1				
Faiyum	C	1																
Gharbiya	C													3				
Minya	C	2																
Sharkiya	C		74															
Suez	C													[3] 1				
Provinces	C	13	46	3	2			2	2				3	6				
Formosa	C						P											
France. (See table below.)																		
French Somaliland	C							5	6	6	6	2	2	2	6	5		
Great Britain:																		
England and Wales	C	1	1	1														
London	C		1															
London and Great Towns	C	1	1															
Greece: Salonika	C		3			1						1	1	1				
Guatemala. (See table below.)																		
Honduras:																		
Tegucigalpa	C	2																
Tela	C				7	1		1			[3] 5		[3] 3					

ndia	C	8,838	4,421	7,163	17,082	4,404	4,951	6,564	7,603	7,336	8,195	7,388						
	D	2,108	846	1,431	4,189	1,104	1,210	1,483	1,647	1,577	1,761	1,604						
Bassein	C								1									
	D								2									
Bombay Presidency	C	1,102	628	1,245	2,834	704	1,150	1,316	1,646	1,879	1,979	2,050	1,870	2,222				
	D	200	132	204	578	173	242	288	316	387	361	348	349	412				
Bombay	C	14	8	5	18	7	28	23	29	56	46	75	58	59	81	91	91	119
	D	6	5	4	11	5	12	15	9	35	22	25	32	28	44	60	57	73
Calcutta	C	16	3	4	51	14	12	19	34	20	42	35	73	58	92	74	56	149
	D	9		1	32	10	9	11	22	16	25	17	45	34	47	47	33	80
Chittagong	C											[3] 1		[3] 2				
Cochin	C							2		4			2			3	1	1
Karachi	C	3			7		6		5	4	8	9	11	8	10	8	11	2
Madras Presidency	C	2,920	2,708	2,753	2,727	974	1,140	1,656	1,554	1,389	1,415	1,041						
	D	515	414	446	408	166	162	221	302	233	241	195						
Madras	C	22	16	5	19	5	7	12	12	14	11	16	7	5	17	10	7	10
Moulmein	C											[3] 1					1	1
Negapatam	C	3	8	3	24	9	10	6	8	10	14	8	11	12	21	8	9	11
Punjab	C		5	60	275	127	43	73	36	52	41	64	36	38	58	69	19	
Rangoon	C	2	3	3	3	2	2	10	10	8	34	27	8	43	75	24	41	33
Tuticorin	C	3	2		3			3	1									1
Vizagapatam	C	1		16	28	54	4	11	23	29	38	23	43	36	21	21	36	30
ndia (French):																		
Chandernagor	C	1								1				2				
Karikal	C	1	4	1	13		8		6		3		8	4				
Mahe	D			3														
Pondichery	C	236	99	89	132	30	17	21	23	25	24	17	12	17				
	D	147	81	45	99	20	17	16	17	20	24	16	12	16				
ndo-China (see also table below):																		
Haiphong	C	1				1									1	2		
Pnom-Penh	C														3	1	1	3
Tourane	C	3	4	3	5	1	1				1	1	3		4	2		
an	C	2	7	4	1	4				3		1	3					
Teheran	C			2	2													
	D	1	1	1														
aq	C	11	3	1	33	20	16		2	2			5		3			
Arbil	C	6	2		3		1			2	2							
Baghdad	C	1	1															
Basra	C				6													
Mosul liwa	C						7		2					6		1		
aly:																		
Genoa	C	2																
Milan	C	2																
apan	C			1	141													
Kobe	C										1							
Taiwan	D				2													

[3] Imported.

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Week ended— January 1935, 5	12	19	26	February 1935, 2	9	16	23	March 1935, 2	9	16	23	30
Liberia.[4]																		
Lithuania. (See table below.)																		
Mexico:																		
Allende.[5]																		
Chihuahua	C	1		2	17		5	1	1		1	5	2	3			15	
Mazatlan [5]	C																	1
Mexico, D. F.	C	8	6		7	4	9	7	17	24	31	36	17					
Monterrey	C													1				
San Luis Potosi	D				1													
Teitipac.[6]																		
Vera Cruz	C																[3] 1	
Morocco. (See table below.)																		
Mozambique. (See table below.)																		
Nigeria	C	215	159	115	328	8		52	18	50	171	78						
Lagos	C	5										1						
Nyasaland. (See table below.)																		
Palestine	C				1				2		4							
Peru. (See table below.)																		
Poland	C	1	1	1														
Portugal (see also table below):																		
Lisbon	C		2	2	1									3		1	1	
Oporto	C	1		1	1													
Portuguese East Africa. (See table below)																		
Salvador	C	12	13	10	28													
Siam	C	32	4	13	20	8	3	12	1		1		1					
Bangkok	C							[3] 1			1							
Sierra Leone	C	285	214	[1] 60	172	[1] 80		[1] 25		[1] 133		[1] 162		[1] 95				
Spain	C	29	22	105	78	7	4	3	2		3	8	4	[1] 3		4		
Straits Settlements: Singapore	C		2															
Sudan (Anglo-Egyptian)	C	1	1		12	2	5	5	1	5	2	1	1			4		
Syria:																		
Damascus	C			33	49		6			2								
Provinces	C	73	51	116	114	1	18	9		3	1				2			
Trans-Jordan	C			[3] 1														
Tunisia	C						5											

Turkey. (See table below.)																	
Union of South Africa C	P																
Union of Soviet Socialist Republics. (See table below.)																	

[1] For 2 weeks.
[2] Imported.
[4] A report states that from February to Sept. 10, 1934, 233 cases of smallpox, with 79 deaths, had been reported in Sanoyea, Liberia. All sanitary measures have been taken.
[5] A report dated Dec. 28, 1934, states that about 48 cases of smallpox, with 5 or 6 deaths, had been reported at Allende, Mexico.
[6] A report dated Aug. 27, 1934, states that smallpox has appeared in the suburbs of Mazatlan, Sinaloa, Mexico; the report also states that 104 deaths from smallpox have occurred in Teitipac, Oaxaca, Mexico.

On vessels:

S. S. *Ethiopa* at Rangoon from Madras	1 case	Sept. 3, 1934
S. S. *Ussuri Maru* at Kobe from Dairen	1 case	Sept. 24, 1934
S. S. *Rohna* at Penang from Madras	1 case	Oct. 4, 1934
S. S. *Erinpura* at Rangoon from Madras	1 case	Oct. 8, 1934
S. S. *Kwang-Si* at Jibuti	1 case	Nov. 24, 1934
S. S. *Varela* at Basra	1 case	Dec. 8, 1934
S. S. *Talma* at Hong Kong	Present	Jan. 19, 1935
S. S. *Aorangi* at Sydney from Vancouver	1 case	Jan. 24, 1935
S. S. *Hosang* at Singapore from Osaka	1 case	Feb. 2, 1935

On vessels—Continued.

S. S. *Mongolia* at Suez from Australia	1 case	Feb. 24, 1935
S. S. *Tatsuta Maru* at San Francisco	1 case	Mar. 14, 1935
S. S. *Tatsuta Maru* at San Francisco	1 case	Mar. 15, 1935
S. S. *Chilka* at Rangoon from Gopalpore	1 case	Jan. 23, 1935
S. S. *Suisang* at Singapore from Hong Kong	1 case	Feb. 27, 1925
S. S. *Empress of Britain* at Singapore from Bombay	1 case	Mar. 3, 1935
S. S. *Pendeen* at Port Said from Odessa	1 case	Mar. 16, 1935
S. S. *Mulbera* at Aden	1 case	Mar. 28, 1935

Place		September 1934	October 1934	November 1934	December 1934	January 1935	February 1935
Angola	C	33					
Belgian Congo (see also table above)	C	183	184	110		109	
Bolivia	C	70	72	53	35		
Chosen	C	15	40	38	15		
Dahomey	C	10	6	1		3	
Ecuador	C	16					
France	C	2	3	53	57	31	137
Guatemala	C		2	1	2		2
Indo-China (see also table above)	C	87	202	259	280	605	582
	D	18	39	22	25	67	69
Lithuania	C				1		
Morocco	C	8		7	5		
Mozambique	C	6	1	36			
Nyasaland	C	29	17	29	13		9
Peru	C	12	195		36	37	
Portugal (see also table above)	C	36	104	150	99	54	
	D	2	6	27	16	4	
Portuguese East Africa	C	6	1	36			
Turkey	C	16	2	2	5	5	19
Union of Soviet Socialist Republics	C	159	231				

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Week ended— December 1934					January 1935				February 1935				March 1935		
					1	8	15	22	29	5	12	19	26	2		16	23	2	9	16
Algeria:																				
Algiers Department	C		4	4			2			2	1	1	1	1				5		
Constantine Department	C	5	4		1			8	5	3	4	2	3	3	11	6	5	13	15	9
Bone	C	1											2							
Constantine	C		2	2	1						1				2	1	3		1	2
Oran Department	C				1	1														
Southern Territories	C																	6		
Basutoland	C	20	46	28	3															
Belgian Congo	C	62	20	12		2		2		1	3									1
Bolivia. (See table below.)																				
British East Africa: Uganda	C			10		1									4			1		
Bulgaria	C		7	7		4	3	4	2			8	2	1						
Chile	C	1,403	1,614	1,642	328	345	355													
Concepcion	C	14					5													
Iquique [1]	C		[2] 4																	
Santiago	C	430				845	86													
Tocopilla	C	1																		
Valparaiso	C	21	17	33	16	15	15	8	14	4	11	6	1	5	1		1		2	1
China:																				
Hankow	C		1																	
Shanghai	C	1				2	1		1										1	
Tientsin	C											1	1							
Chosen. (See table below.)																				
Colombia	D											1								
Czechoslovakia. (See table below.)																				
Egypt:																				
Alexandria	C		1				1				1				1	2	2	3	1	3
Aswan	C			2	2	1													9	7
Asyut	C															1				4
Beheira	C	1			3		2	4	8	8	14			44	23	37	58	34	34	53
Beni-Suef	C														3					2
Cairo	C			1					1		1					3	4	2		
Dakahliya	C			1							4		6	3	15	44	46	22	18	12
Damietta	D		1				1													
Fbiyum	C		1																	
Gharaiya	C	8	1	6		1		2	3		4		29	38	41	73	84	61	40	58

Girga	C										1									
Minufiya	C			15	4	2	3	11	1	1	2			4	7	9	13	7	10	16
Port Said	C			2				1	1					1						
Qena	C		3	1		2	2		2											
Sharkiya	C	1				1					1		6	4	7	12	9	7	4	9
Provinces	C	35	10	29	9	7	9	18	16	9	27	39	68	87	95	182	217	137	118	168
Greece (see also table below); Salonika	C	2	3	4	1	1	1	1	1											
Guatemala. (See table below.)																				
Hungary	C	1			6		1		1			1				1				
Indo-China. (See table below.)																				
Iran	C	47	19	18	5	10	25	19	9	22	17	21	16	12	8	15	25	32	28	16
Teheran	C	10	1										1							3
Iraq:																				
Baghdad	C	1	1			1														
Mosul liwa	C	3																		
Irish Free State:																				
Cork County—Castletown	C																		1	
Waterford County—Lismore	C	1	1																	
Italy: Leghorn	C	4	1																	
Japan:																				
Aomori Prefecture	C	1																		
Kobe	C		1																	
Nagasaki	D	1																		
Latvia. (See table below.)																				
Libya: Tripolitania	C														2			2		2
Lithuania	C	2	3	1	1	8	4		3	3	7		9	7	14	6	13	18	8	8
Mexico:																				
Guadalajara	D	1																		
Mexico, D. F	C	26	14		3	18	7	8	3	9	22	10	20	13	8	18	10			
Saltillo	D	2	1																	
San Luis Potosi	D		2																	
Torreon	C		5	1				1	1							1				
Morocco	C	1		1	7	2	6	1	1		3	3	1		4	6	14	4	5	3
Palestine	C	3	4							2										
Haifa	C	1	4	4		2		1	1							1	1			1
Jaffa	C						1			2										
Peru. (See table below.)																				
Poland	C	53	48	61	27	12	38	33	14	34	36	60	69	69	82	57	83	84	128	118
	D	1	5	9	4	3	1	1	1	3	1	6	7	4	3	8	6	2	11	8
Portugal (see also table below):																				
Oporto	C	1				2														
Tarouca (near)	C										28									
Rumania. (See table below.)																				
Spain	C	1																		
Straits Settlements: Singapore	C									1							2			
Syria	C													1						
Trans-Jordan	C															2			4	2

[1] For the week ended Mar. 9, 1935, 11 cases of typhus fever were reported at San Jose nitrate camp about 42 miles from Iquique, Chile.
[2] Imported.

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Week ended— December 1934					January 1935				February 1935				March 1935		
					1	8	15	22	29	5	12	19	26	2	9	16	23	2	9	16
Tunisia:																				
Tunis	C		1	1	3				1										1	
Provinces	C	18	22	35	10	1	8	21	16	9	2	18	20	10	14	25	18	7	16	18
Turkey. (See table below.)																				
Union of South Africa (See table below.)																				
Union of Soviet Socialist Republics (See table below.)																				
Yugoslavia. (See table below.)																				

Place		September 1934	October 1934	November 1934	December 1934	January 1935	February 1935
Bolivia	C	33	46	40	103		
Chosen	C	7	22	41	29		
Czechoslovakia	C				7	15	
Greece	C	7	6	5	15	3	
Guatemala	C	31	18	18	21	31	20
Indo-China (French)	C					2	
Latvia	C		3		8	2	
Peru	C	63	86	52	17	13	
Portugal	C	7	10	8	27	12	
Rumania	C	16	48	85	127	246	163

Place		September 1934	October 1934	November 1934	December 1934	January 1935	February 1935
Turkey	C	10	16	20	32	22	45
Union of South Africa:							
Cape Province	C	437	407	223	163	158	
Natal	C	6	29	4	8	6	
Orange Free State	C	492	403	309	296	133	
Transvaal	C	105	32	39	29	14	
Union of Soviet Socialist Republics	C	2,631	4,787				
Yugoslavia	C	12	31	3	17	55	83

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Week ended— December 1934					January 1935				February 1935				March 1935		
					1	8	15	22	29	5	12	19	26	2	9	16	23	2	9	16
Brazil:																				
Goyaz State.[1]																				
Mato Grosso State: Coronel Ponce.[2]																				
Colombia: Intendencia of Meta—																				
Restrepo	C																	2		
	D			3						1			3		1					
Villavicencio	D														1					
French Equatorial Africa: Middle Congo—Pointenoire	C																			[3] 2
French West Africa—Guinea—Kindia	C	1																		
Gambia:																				
Bathurst	C			1				2		1										
St. Mary's Island	C			2																
Gold Coast:																				
Aperadi	C										2	1								
	D										1									
Kokobee	C			1																
Oda	C										1									
Wenchi	C			1																
Ivory Coast:																				
Abidjan	C	1																		
Agboville	C	1																		
Banguoanou	C													1						
Bassam [4]																				
Bobo-Diolasso [4]	C		[3] 1														1			
Dibro	C					3														
	D					1														
Diekekro	C						1													
Dimbokro	C											1								
Gagnoa [3]	C																	1		
Ouagadougou	C																1			
Tirailleur	C		1																	

[1] A report dated Mar. 17, 1935, stated that yellow fever was present in 6 localities of Goyaz State, Brazil.
[2] During the month of October 1934, 1 case of yellow fever was reported at Coronel Ponce, Mato Grosso State, Brazil.
[3] Suspected.
[4] For the period Mar. 11–20, 1935, 1 case of yellow fever with 1 death was reported near Bassam, Ivory Coast.

YELLOW FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		Aug. 26–Sept. 29, 1934	Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Week ended—															
					December 1934					January 1935				February 1935				March 1935		
					1	8	15	22	29	5	12	19	26	2	9	16	23	2	9	16
Ivory Coast—Continued.																				
Toumodi	C					15			1											
	D					10														
Zuenoula	C					1														
Nigeria: Kano	C						2			1										
Niger Territory:																				
Maradi	C	1																		
Zinder	C		1								1									
	D		1																	
Sierra Leone:																				
Freetown.[5]																				
Hill Station (near Freetown)	C										1									

[5] During the week ended Mar. 23, 1935, 1 case of yellow fever was reported at Freetown, Sierra Leone.

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DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen. R. C. WILLIAMS, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

VOL. 50 MAY 3, 1935 NO. 18

RELATION OF SICKNESS TO INCOME AND INCOME CHANGE IN 10 SURVEYED COMMUNITIES *

Health and Depression Studies No. 1: Method of Study and General Results for Each Locality

By G. St. J. Perrott, *Consultant*, and Selwyn D. Collins, *Senior Statistician United States Public Health Service*

CONTENTS

The ordinary barometers of health—death rates and reports of communicable diseases—do not indicate that harmful effects of the depression upon the health of the population as a whole have taken place. The comfortable conclusion is drawn by many that the physical well-being of the American people not only has not suffered but, in view of the continued low death rate,[1] may have been benefited

* From the Office of Statistical Investigations, U. S. Public Health Service, and the Division of Research, Milbank Memorial Fund.

This study was made also in cooperation with the international inquiry being carried out in various countries under the general auspices of the health organization of the League of Nations, the members of the American committee being Edgar Sydenstricker, Milbank Memorial Fund; Louis I. Dublin, Metropolitan Life Insurance Co.; Walter F. Willcox, Cornell University; and Selwyn D. Collins, U. S. Public Health Service.

This is the first of a series of papers on sickness and medical care among groups of white wage-earning families severely affected by unemployment during the economic depression. Preliminary papers, giving results for parts of the surveyed group, have been published as follows: Perrott, G. St. J., Collins, Selwyn D., and Sydenstricker, Edgar. Sickness and the economic depression, Public Health Reports, Oct. 13, 1933 (Reprint No. 1598). Perrott, G. St. J., and Collins, Selwyn D.: Sickness and the depression, Milbank Memorial Fund Quarterly Bulletin, October 1933, vol. 11, no. 4, pp. 281–298; January 1934, vol. 12, no. 1, pp. 28–34; July 1934, vol. 12, no. 3, pp. 218–224; American Journal of Public Health, February 1934, vol. 24, no. 2, pp. 101–107. Collins, Selwyn D., and Perrott, G. St. J.: The economic depression and sickness, Journal of the American Statistical Association, March 1934, Supplement 29, pp. 47–51. Perrott, G. St. J., Sydenstricker, Edgar, and Collins, Selwyn D.: Medical care during the depression, Milbank Memorial Fund Quarterly Bulletin, April 1934, vol. 12, no. 2, pp. 99–114. Sydenstricker, Edgar, and Perrott, G. St. J.: How unemployment affects illness and hospital care, The Modern Hospital, March 1934, vol. 42, no. 3, pp. 41–44.

[1] The death rate from all causes reached the lowest figure on record in the first half of 1933, but during the winter of 1933–34 mortality was on a slightly higher level than in corresponding months of immediately preceding years, except for periods in those years when influenza was epidemic. While the rise was slight, it is consistently evident in a large proportion of the 28 States for which preliminary figures are available. (See Public Health Reports, Nov. 9, 1934, Mortality from certain causes during the first half of 1934.)

by the economic catastrophe. Such a conclusion, based upon mortality statistics alone, is open to question. Even in the worst depression the families of the unemployed are a minority, and the trend of mortality in the total population does not necessarily reflect the trend in these severely affected households.

The assumption that *mortality* in the general population is an accurate index of *sickness* in the families of the unemployed is still less tenable. Recent morbidity studies [2] have shown that the important causes of death are *not* the most frequent causes of illness. The number of illnesses severe enough to be remembered and reported, even in relatively infrequent canvasses of households, is 75 to 100 times the number of deaths. For digestive, respiratory, eye, ear, and skin affections and the common communicable diseases of childhood, the disparity between sicknesses and deaths is even greater. In depending upon deaths to indicate trends in health we are relying on a small and probably biased sample of the cases of illness. The desirability of checking up on *all* illnesses before drawing conclusions from data based only on the *fatal* cases seems apparent.

Among the now well-recognized indexes of ill health are records of sickness. When properly obtained and analyzed, they reveal some of the reactions of human beings to immediate environmental factors in a far more sensitive degree than the gross death rate or even mortality by cause can possibly do. Since no national system for the complete registration of sickness exists, special records must be collected, a difficulty not without its advantages, since it permits information to be obtained for such groups and in such detail as may be desired. One phase of the study of health and the depression by the Public Health Service and the Milbank Memorial Fund utilized this method extensively. A sickness and mortality survey was made in 1933 of nearly 12,000 wage-earning families which had suffered from the depression in varying degrees of severity. Among the more specific purposes of the study were the following:

1. To ascertain whether or not there is any association between income changes during the depression and ill health as measured by morbidity and mortality.
2. If such an association exists, to discover what kinds of sickness are chiefly responsible for the association.
3. To determine the amount and kinds of medical care received by various economic groups of the people.
4. To study diets and housing conditions of selected families among the employed and the unemployed.
5. Using school records of height and weight, to study the growth of children in families of the "new poor" in the surveyed households as compared with children in families that remained in comfortable circumstances throughout the depression.

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[2] Hagerstown Morbidity Studies, the Public Health Reports for Feb. 13, 1925, and June 14, 1927 (Reprints 989 and 1167), respectively; Morbidity in 18 States, Public Health Reports for Mar. 24, 1933 (reprint 1563), and Publication No. 27 of the Committee on the Costs of Medical Care, University of Chicago Press, 1933.

METHOD AND SCOPE OF SURVEY

The survey was made by house-to-house canvasses in 10 localities. These included eight large cities—Baltimore, Birmingham, Brooklyn, Cleveland, Detroit, New York (Borough of Manhattan), Pittsburgh, and Syracuse, a group of coal mining communities in the vicinity of Morgantown, W. Va., and a group of cotton-mill villages in the vicinity of Greenville, S. C. About 1,200 families were visited in each locality.

No attempt was made to select sections that would be representative of the city as a whole; only the poorer districts were canvassed. Slum areas were not included, because they would contain too many families who had never, even at the height of prosperity, been self-supporting. Well-to-do sections were omitted as being still above a standard of living that could affect health adversely, even though great decreases in income had taken place. Colored sections were excluded to avoid the question of racial differences in employment, income, and sickness. In blocks or streets that were surveyed, every white family was included, whether employed or unemployed and whether recently poor or never self-supporting. Those families whose breadwinners still had their jobs were to serve an important role in the study, viz, as a control group whose illness rate would be a yardstick which would be essential in interpreting the illness rates found for those who had suffered economic reverses.

Previous experience in sickness surveys indicates that a single interview of a housewife will not yield a reasonably complete record of illness for a longer period than about 3 months. Even for that period, one cannot expect to get all of the many minor respiratory and digestive conditions that caused no disability but would be reported as illness if visits were made at weekly or semimonthly intervals. With this limitation on the illness record that could be secured, the problem was to plan a survey, with only one visit to the households, that would nevertheless afford more than a comparison of illness rates among poor and comfortable or among employed and unemployed at or immediately preceding the time of the canvass. A feasible method seemed to be to obtain for each member of the family (1) a record of illness and medical care for the 3 months preceding the date of the canvass, and (2) a record of occupation, wages earned, and regularity of employment for each year from 1929 to 1932 of sufficient detail to compute the family income. These data enable us to relate current illness to *changes* in income during the depression as well as to present economic and employment status. The accuracy of the 4-year income record may be doubted; but this was a period of such tremendous changes in economic well-being that small errors did not interfere with a reasonably good classification of the families according to income change since 1929.

Although the enumerators were hired locally, the canvass in each city was in immediate charge of a person trained in the collection and tabulation of such data, who was assigned from the permanent personnel of the Public Health Service or the Milbank Memorial Fund. Because of the prevailing economic conditions it was possible to get exceptionally good enumerators. These enumerators canvassed families only after they had received careful instruction and had made trial visits with the local supervisor. All persons worked under uniform written instructions. Thoroughness, rather than speed, was encouraged in the enumerators. One of us (G. S. P.) acted as general supervisor and visited all but two of the communities either to start the work (select districts, enumerators, etc.) or to check the selections made by the local supervisor.

THE POPULATION SURVEYED

Number.—In the 10 localities, schedules were obtained from about 12,000 families. The data from 11,511 of these families, including 49,136 individuals, were finally coded and transferred to punch cards, and the remainder were discarded because of incompleteness of information on the schedule. In table 1 the percentage distribution of families in each locality is given according to nativity, occupation, employment status, and relief status. Only those families are included on which economic data were complete for the 4 years, 1929–32, as the major part of the sickness tabulations refer to this group.[2]

Nativity.—Considering the 8 large cities, in 40 percent of the families the male household head was native white of native parents, in 18 percent of foreign or mixed parents, and in 42 percent foreign born.[3] The nativity of family heads varied considerably from city to city. Birmingham and Greenville were largely native white of native parents (95 and 100 percent, respectively), while in New York and Cleveland 60 percent of the family heads were foreign born (18 and 22 percent, respectively, native white of native parents). The racial stock of the group of foreign or mixed parents was largely English, Irish, and German, while that of the foreign-born group was more evenly distributed between English, Irish, Italian, Polish, and Slavic.

[2] Incomplete economic data prevented the use of 1,657 families in tabulations in which income classifications were made; 727 families whose heads were married since 1929 were omitted from tabulations where families were grouped by change in income between 1929 and 1932. This left a total of 9,127 families, including 40,184 individuals, in the 10 surveyed localities, on which economic data were complete for the 4 years and other information was reasonably detailed also. These families were used in all tabulations for the localities considered separately, when classification was made by income. For many tabulations the 8 large cities were combined into one group which comprised 7,436 families, including 31,635 individuals. The entire group of 11,511 families has been used in showing the association between illness and unemployment in 1932.

[3] While no attempt was made to secure sample populations representative of the city, the nativity of the heads of surveyed families is similar to that of the 1930 census for each city (excluding Negroes) with the exception of Brooklyn and Syracuse. If the census data for each city are weighted by the number of families in the surveyed population, the average so obtained gives 40 percent native white of native parents, 23 percent native white of foreign or mixed parents and 37 percent foreign born, as compared with percentages of 40, 18, and 42, respectively (see table 1), which were actually found in the surveyed families.

TABLE 1.—*Percentage distribution of white wage-earning families* [1] *by (1) nativity of household head, (2) occupational status of chief wage earner, (3) number of wage earners in family in 1929 and 1932, and (4) families on relief at any time during 1932*

Locality	Percentage distribution of families according to specified classification																Total number of families observed [1]
	Nativity of household head			Occupational status of chief wage earner [2]				Wage earners in family [3]								Families on relief	
								1929				1932					
				Usual or 1929 occupation				All unemployed				All unemployed					
	Native—native parents	Native—foreign parents	Foreign-born	White-collar	Skilled labor	Unskilled labor	Percent unemployed, 1932	Family has income or pension	Other families with no workers	One or more part-time, no full-time	One or more full-time	Family has income or pension	Other families with no workers	One or more part-time, no full-time	One or more full-time		
Baltimore	67	14	19	17	60	23	16	2	--------	10	88	3	9	39	49	24	961
Birmingham	95	3	2	36	62	2	8	2	--------	10	88	3	5	32	60	11	780
Brooklyn	36	33	31	32	58	10	6	4	--------	7	89	5	2	23	70	4	731
Cleveland	22	18	60	19	59	22	28	5	1	20	74	11	14	39	36	23	1,047
Detroit	30	15	55	16	63	21	19	3	2	22	73	4	16	48	32	25	1,003
New York	18	22	60	19	55	26	14	4	--------	12	84	8	6	28	58	13	1,225
Pittsburgh	44	22	34	20	48	32	19	3	1	13	83	4	12	38	46	21	789
Syracuse	27	16	57	17	58	25	24	3	3	18	76	6	16	39	39	30	805
Greenville	100	--------	--------	3	91	6	2	1	--------	4	95	1	--------	73	26	2	952
Morgantown	58	6	36	3	42	55	1	1	--------	27	72	1	--------	71	28	2	739
Total, 10 localities [4]	48	15	37	18	60	22	14	3	0.6	14	82	5	8	43	44	16	9,127
Total, 8 large cities [5]	40	18	42	21	58	21	17	3	0.8	14	82	6	10	36	48	20	7,436

[1] Excludes 1,657 families for which economic data were incomplete and 727 families where marriage took place in 1930 or later. These are excluded also from tables 2, 3, 5, 6, and 7, but are included in table 4. The newly married families could not be used in tabulations dealing with illness and income change, 1929–32, because they were not an economic unit under observation in 1929.

[2] Excludes unknown occupations. The term "white-collar" is here used to include all workers other than skilled and unskilled laborers, that is, professional, proprietary, and clerical. "Skilled" includes "semiskilled." Farm laborers were present to a negligible extent and have been included with unskilled laborers. Household heads living on income or pension are not included with the unemployed in 1932 and are excluded from the population in making this computation.

[3] Welfare work, when the sole occupation, was considered "unemployed."

[4] Weighted average.

[5] Weighted average. Excludes Greenville and Morgantown.

Occupation.—The population was largely of the wage-earning class. In the 8 large cities the usual occupation of the chief wage earner was that of skilled or semiskilled laborer in 58.1 percent of the families; unskilled, 20.5 percent; clerical and kindred worker, 12.0 percent; proprietor, manager, or official, 7.8 percent; professional, 1.6 percent.[4] In 1932 in 17 percent of the families the chief wage earner was without employment throughout the year. This figure varied from 6 percent in Brooklyn to 28 percent in Cleveland. In Greenville and Morgantown only 1 to 2 percent of the chief wage earners were unemployed in 1932. This low figure was due to the fact that only families having workers employed in the mills or mines were allowed to live in these company-owned villages.

TABLE 2.—*Occupation shifts of chief wage earners between 1929 and 1932 in white families in 8 large cities*

Occupation of household head in 1929	Number of families [1]	Percentage of chief wage earners in each occupational group in 1932						
		Unemployed	Professional	Proprietary	Clerical	Skilled	Unskilled	Total, all occupations, 1932
Professional	109	5.5	90.9	1.8	0.9	--------	0.9	100.0
Proprietary	532	8.6	--------	83.9	3.4	3.0	2.1	100.0
Clerical	814	6.1	.1	1.1	87.1	3.0	2.6	100.0
Skilled	3,946	17.8	.1	.9	.6	76.4	4.2	100.0
Unskilled	1,389	24.9	.1	.8	.6	1.9	71.7	100.0
All occupations	6,790	16.9	1.5	7.3	11.2	45.4	17.7	100.0

[1] Excludes families in which chief wage earner lived on income or pension in 1929 or 1932, families in which chief wage earner died after 1929, and families in which occupation of chief wage earner in 1929 or 1932 was unknown.

Unemployment and the shift in occupations between 1929 and 1932 are shown in table 2. Unemployment was highest among the unskilled laborers (25 percent) and lowest among the professional class (5.5 percent). Among skilled and unskilled laborers, the greatest shift was into the unemployed group, while in the clerical and proprietary classes, those who changed occupational status between 1929 and 1932 were about equally divided between the group that became unemployed and the groups that found other occupations. For example, 72 percent of the unskilled laborers were employed in the same class of occupation in 1932, 25 percent were unemployed, and 3 percent were in different occupational groups; 83 percent of the proprietary

[4] Gainful white workers in the United States in 1930 similarly classified (excluding farm owners, tenants, and laborers) are distributed approximately as follows: Skilled and semiskilled, 39 percent; unskilled, 20 percent; clerks and kindred workers, 23 percent; proprietors, managers, and officials, 10 percent; professional workers, 8 percent. While the figures are not strictly comparable since the data of the present survey give the distribution of *families* by occupation of the chief wage earner, they indicate that the surveyed population contains an excess of skilled laborers and a deficiency of clerks and professional workers, as compared with the general population of the United States. See Edwards, Alba M.: A Social-Economic Grouping of the Gainful Workers in the United States. Journal American Statistical Association, December 1933, vol. 28, pp. 377-387.

class remained in that category in 1932, 9 percent were unemployed, and 8 percent were in the clerical, skilled, and unskilled classes.

Employment status.—Considering all wage earners in the family, the data (table 1) show that in 1929 only 0.8 percent of the families in the 8 large cities had no employed workers, 14 percent had one or more part-time workers and no full-time workers, 82 percent had one or more full-time workers, with or without part-time workers, and 3 percent had wage earners living on income or pension. In 1932 there were 10 percent with no employed workers, 36 percent with part-time workers only, 48 percent with full-time workers, and 6 percent with wage earners living on income or pension. In 1932, 20 percent of all surveyed families were on public or private relief for part or all of the year. This proportion varied from 4 percent in Brooklyn to 30 percent in Pittsburgh.

Greenville and Morgantown presented an entirely different picture, with 72 percent of the families having part-time workers only, 28 percent having full-time workers, and no families having all workers unemployed. The reasons for this different showing have been discussed in a preceding paragraph.

Economic history of families.—Income as computed in this study includes all receipts from any source—wages, rents, interest, and profits, and also the amount of savings or borrowed funds used and the value of a food ticket or other receipts from public or private relief agencies. The figures for 1929, when only 4 percent of the families used savings or borrowed funds, represent income in the accepted sense of the word and may exceed expenditures; the figures for 1932, when about 20 percent of the families augmented their purchasing power by some use of savings or borrowed funds, are more properly called expenditures. This definition of income was adopted because it was desired to relate incidence of illness to standard of living, as expressed by expenditures rather than by actual income.

No attempt was made to select districts in which the income distribution of the surveyed families would be representative of the city as a whole. The plan, as already outlined, was to include sections having families that, in normal times, were in moderate circumstances, but that in large numbers had been reduced to poverty during the depression.

In table 3 the distribution of families in the 8 large cities by total income is shown for each year from 1929 to 1932, and for comparison the income as estimated for all nonfarm families in the United States.

The mean income of the surveyed group in 1929 was $1,830, as compared with $3,225 for the United States. The median income, which affords a better comparison, was $1,650 in the surveyed group and $1,900 for nonfarm families in the United States. If families with incomes above $4,000 are excluded (these constitute 15 percent

of the nonfarm families in the country), the income distribution of the surveyed group in 1929 is not far different from that of the nonfarm in the United States.[5] By 1932, the median income of the surveyed group was $870, which is a drop of 47 percent. In 1929, 26 percent of the canvassed families had incomes less than $1,200 per year, as compared with 66 percent in 1932. On the other side of the picture, 35 percent of the families had incomes over $2,000 in 1929 as compared with 10 percent in 1932.

TABLE 3.—*Percentage distribution according to total income of families (1) in the surveyed population in 8 cities for 1929, 1930, 1931, and 1932, and (2) as estimated for the United States in 1929*

Total family income per year	Surveyed group in 8 cities[1]				Nonfarm families United States[2]
	1929	1930	1931	1932	1929
Under $600	6.9	12.4	20.9	32.4	4.0
$600, but under $1,200	19.5	25.5	31.0	33.7	17.4
$1,200, but under $2,000	38.5	35.2	30.0	23.4	32.0
$2,000, but under $3,000	24.2	19.0	13.5	8.0	21.1
$3,000, but under $4,000	7.3	5.4	3.2	1.7	10.2
$4,000 and over	3.6	2.5	1.4	.8	15.3
Total, all incomes	100.0	100.0	100.0	100.0	100.0
Number of families	7,436	7,436	7,436	7,436	21,674,000
Median income	$1,650	$1,440	$1,160	$870	$1,900
Mean income	1,830	1,600	1,325	1,050	3,225

[1] Baltimore, Birmingham, Brooklyn, Cleveland, Detroit, New York, Pittsburgh, and Syracuse.
[2] America's Capacity to Consume. By Maurice Leven, Harold G. Moulton, and Clark Warburton. The Brookings Institution, Washington, D. C., 1934.

The change from one income class to another is better shown in table 4, which indicates the correlation between 1929 and 1932 income. For example, in the group of families having less than $600 annual income in 1929, 80 percent were still in that class in 1932. In the group having incomes between $2,000 and $3,000 in 1929, 17.5 percent were still in that class in 1932, 1 percent had risen to higher brackets, and the remainder had fallen into lower income groups.

The table suggests a means of classifying families according to economic experience, which is used later in relating sickness to *change* in income during the depression. For example, the group of families with less than $600 annual income in 1932 constituted 32 percent of the surveyed group in the 8 large cities. Of this group, only 17 percent had been in this class in 1929, 66 percent had incomes between $600 and $2,000, and 17 percent had incomes over $2,000 in 1929. In this study of illness as related to income change, we are particularly interested in 3 general classes of the population: (1) Families re-

[5] The relatively high mean income ($3,225) in the nonfarm families in the United States is due mainly to the families in the group above $4,000, which constitute 15 percent of the families but receive 50 percent of the total income. In contrast, families receiving incomes over $4,000 are less than 4 percent of the surveyed group and receive about 10 percent of the total income. This is reflected in the fact that while the *mean* income of nonfarm families in the United States was 75 percent higher, the *median* income was only 12 percent higher than that of the surveyed group in 1929.

TABLE 4.—*Income distribution in 1932 of families in 8* [1] *cities classified in 6 groups according to 1929 income*

Annual family income in 1929	Number of families	Percentage of families in each income group in 1929 which was in the specified group in 1932						
		Under $600	$600 but under $1,200	$1,200 but under $2,000	$2,000 but under $3,000	$3,000 but under $4,000	$4,000 and over	Total, all incomes 1932
Under $600	514	80.2	17.5	1.9	0.4			100.0
$600 but under $1,200	1,450	49.6	43.6	6.3	.5			100.0
$1,200 but under $2,000	2,860	31.0	39.3	27.6	1.9	0.2		100.0
$2,000 but under $3,000	1,801	17.5	29.3	34.6	17.5	1.0	0.1	100.0
$3,000 but under $4,000	540	10.7	18.9	29.4	28.2	11.5	1.3	100.0
$4,000 and over	271	6.6	12.5	24.0	24.4	14.4	18.1	100.0
All incomes 1929	7,436	32.4	33.7	23.4	8.0	1.7	.8	100.0

[1] Baltimore, Birmingham, Brooklyn, Cleveland, Detroit, New York, Pittsburgh, and Syracuse.

maining in reasonably comfortable circumstances throughout the 4 years; (2) families that suffered material loss of income and, hence, lowered standard of living during the depression; and (3) families that were poverty-stricken even in 1929—the chronic poor. The first and third groups serve as controls, whose illness rates are compared with those of families that had suffered economic reverses.

DEFINITION OF ILLNESS AND METHOD OF CLASSIFYING

Inquiry was made about illness from all diseases and accidents, including mild as well as severe cases. What was included as illness was, to a considerable extent, a matter of what the informant (usually the housewife) remembered and designated as such. Hence the records of disabling cases are probably a better measure of real sickness than are the total cases, because the disabling illnesses are more likely to be accurately and completely reported. A case sufficiently severe to be disabling or confine the individual to his bed within 3 months of the interview is very likely to be remembered, while many of the minor ailments are forgotten and are consequently not mentioned to the enumerator.

The illness rates are for the 3-month period of the survey and are not reduced to an annual basis. All rates are adjusted for differences in age distribution.[6] The "survey period" refers to the 3 months prior to the enumerator's visit; it is the period of time for which illness data are recorded. The canvass in each city required from 3 to 4 weeks. The dates of the canvass were slightly different in each locality, but fell between March 20 and May 15, 1933, for all localities.

Illnesses were classified according to whether their time of onset was within the survey period of 3 months or prior to the survey, the

[6] All illness rates are adjusted for age, using the method of expected cases as outlined by Raymond Pearl in Medical Biometry and Statistics, pp. 265–269, second edition, 1930. The standard age-specific rates which are used in the adjustment process are rates for all economic groups in all surveyed localities.

latter including illnesses that were more or less chronic. Each of these 2 groups was further subdivided into disabling and nondisabling cases. All bed cases are included in the disabling class. A disabling illness, whether its onset was within or prior to the survey period, refers to a case causing inability to pursue the usual work, school, or other activities for 1 or more days during the 3 months of the study; 86 percent of the disabling cases with onset within and 69 percent of those with onset prior to the survey were also in bed for 1 or more days during the study period.

ILLNESS EARLY IN 1933 AND UNEMPLOYMENT IN 1932

In table 5 the incidence of illness is shown for 3 groups of the entire surveyed population in the 10 localities classified according to employment status of the wage earners in 1932. Illnesses are shown as (1) All

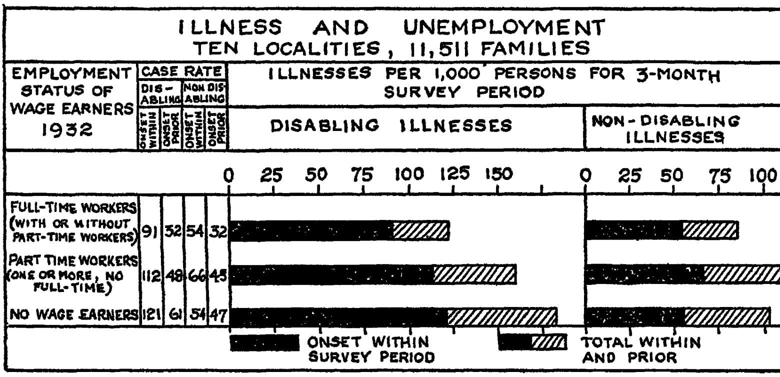


FIGURE 1.—Incidence of disabling and nondisabling illness in 10 localities during a 3-month period in the early spring of 1933 in white wage-earning families classified according to number of employed workers in 1932 (Rates are adjusted for age)

cases; (2) nondisabling cases; and (3) disabling cases (*a*) not in bed, (*b*) in bed. In figure 1 disabling and nondisabling cases are shown for the same groups of the surveyed population as appear in table 5. The chart shows a lower incidence of disabling illness among families having full-time workers than in families having part-time workers only or families having no wage earners. The group with no employed workers has an incidence of disabling illness, onset within the survey period (121 cases per 1,000 persons), that is 33 percent higher than the rate of the group having full-time workers (91 per 1,000). Illnesses with onset prior to the period (largely chronic) are nearly twice as high in the group without employed wage earners as in the group having full-time workers (61 as against 32 disabling cases per 1,000 persons). Combining disabling illnesses having onset within and prior to the study, the unemployed group shows a rate (182 cases per 1,000) 48 percent higher than the families having full-time workers (123 per 1,000). Nondisabling cases with onset within the survey period show no logical relationship to employment status;

TABLE 5.—*Illness and unemployment*

[Incidence of disabling and nondisabling illness in the early spring of 1933 in 11,511 white wage-earning families classified according to employment status of wage earners during 1932, in 10 localities]

Employed workers in the family	Case rate [1] per 1,000 persons for 3-month survey period								Population observed
	Onset within period				Onset prior to period				
	Total	Nondisabling	Disabling: Not in bed	Disabling: In bed	Total	Nondisabling	Disabling: Not in bed	Disabling: In bed	
Full-time workers (1 or more, with or without part-time)	145	54	13	78	64	32	9	23	21,022
Part-time workers (1 or more; no full-time)	178	66	15	97	93	45	15	33	21,224
No employed workers	175	54	14	107	108	47	21	40	4,935
Total population [2]	163	59	14	90	81	39	13	29	47,181

[1] Adjusted for differences in age distribution.
[2] Excludes 1,955 individuals living on income or pension.

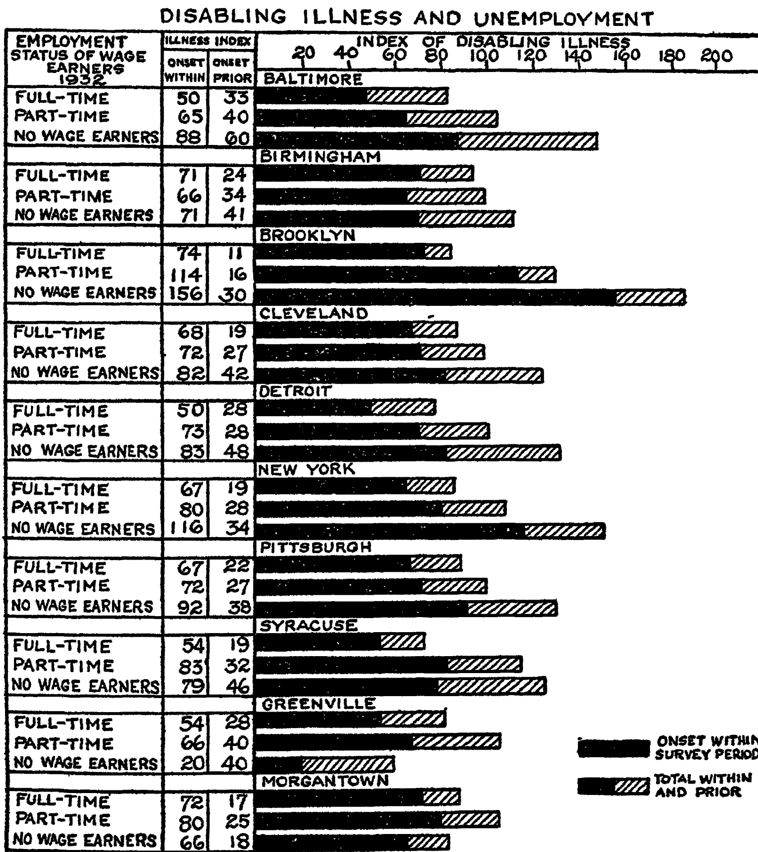


FIGURE 2.—Disabling illness in each of 10 localities, during a 3-month period in the early spring of 1933 in white wage-earning families classified according to number of employed workers in 1932. (Illness rates, adjusted for age, are expressed as an index (100 equals the disabling illness rate, adjusted for age, onset within and prior to the survey period, for the entire canvassed population in the specified city).)

nondisabling cases with onset prior to the period are 47 percent higher in the group having no wage earners than in the group having full-time workers (47 as against 32 cases per 1,000 persons).

In figure 2 and table 6 similar data are given for disabling illnesses for each of the 10 localities. A disabling illness index (100 equals the disabling illness rate, adjusted for age, onset within and prior to the period, for the entire surveyed population in the specified city) is used in figure 2 instead of the actual rate. This eliminates differences in rates from city to city and shows only the relative variation of the illness rate with employment status of the family wage earners. Actual rates adjusted for differences in age distribution, as well as cases of illness and population observed are given in table 6.

TABLE 6.—*Disabling illness in the early spring of 1933 and employment status of wage earners in 1932 in white wage-earning families in each of 10 localities*

Locality	Disabling illness per 1,000 persons for 3-month survey period [1]			Cases of disabling illness				Population observed				
	Full time	Part time	Unemployed	Full time	Part time	Unemployed	Income or pension	Total	Full time	Part time	Unemployed	Income or pension
Baltimore								5,167	2,572	1,960	531	104
Onset within	68	88	119	168	180	68	7					
Onset prior	45	55	81	119	106	42	16					
Birmingham								4,137	2,342	1,366	322	107
Onset within	105	97	104	243	135	34	14					
Onset prior	35	51	61	83	69	19	17					
Brooklyn								3,547	2,295	777	110	365
Onset within	81	125	171	178	95	19	26					
Onset prior	12	17	33	32	16	4	18					
Cleveland								5,080	1,814	2,015	811	440
Onset within	89	95	109	150	189	93	44					
Onset prior	25	35	56	49	70	42	26					
Detroit								5,633	1,842	2,676	933	182
Onset within	63	93	105	114	256	101	17					
Onset prior	36	36	61	65	88	53	15					
New York								5,079	2,917	1,423	441	268
Onset within	108	130	186	302	182	92	42					
Onset prior	31	46	55	96	70	21	13					
Pittsburgh								5,031	2,151	1,904	800	176
Onset within	102	109	140	206	203	113	15					
Onset prior	33	41	58	82	81	46	19					
Syracuse								5,044	2,022	1,914	889	219
Onset within	74	114	108	142	219	102	12					
Onset prior	26	44	63	55	84	53	29					
Greenville								5,653	1,594	3,986	48	25
Onset within	110	134	40	180	563	2	1					
Onset prior	57	82	80	76	277	3	6					
Morgantown								4,765	1,443	3,203	50	69
Onset within	111	123	102	166	409	6	3					
Onset prior	27	38	28	32	90	1	8					
Total, 10 localities [2]								49,136	21,022	21,224	4,935	1,955
Onset within	91	111	118	1,849	2,431	630	181					
Onset prior	33	44	58	689	960	284	167					
Total eight large cities [3]								38,718	17,985	14,035	4,837	1,861
Onset within	86	106	130	1,503	1,459	622	177					
Onset prior	30	41	59	581	584	280	153					

[1] Adjusted for age. Rates are not given for the group living on income or pension, because of the small number of persons included in this group in many of the cities. The average disabling illness rates in the group living on income or pension in the 10 localities are as follows: Onset within period, 89 cases per 1,000; onset prior, 87 cases per 1,000. For the 8 large cities, the corresponding illness rates are, respectively, 102 and 63 cases per 1,000 persons.

[2] Illness rates are simple averages of rates in the 10 localities.

[3] Excludes Greenville and Morgantown. Illness rates are simple averages of rates in the 8 large cities.

With the exception of Greenville and Morgantown[7] it will be seen that the disabling illness rate of families having no employed workers is consistently higher *in each city* than that of families having part-time or full-time workers. Inasmuch as most of the families having no employed workers in 1932 had one or more employed workers in 1929, these data are striking evidence of the association between a relatively high rate of disabling illness and loss of employment during the depression, with accompanying loss of income and reduced standard of living.

ILLNESS EARLY IN 1933 AND INCOME IN 1932

When families are grouped according to income in 1932, the same inverse association of illness rates with economic well-being is evident

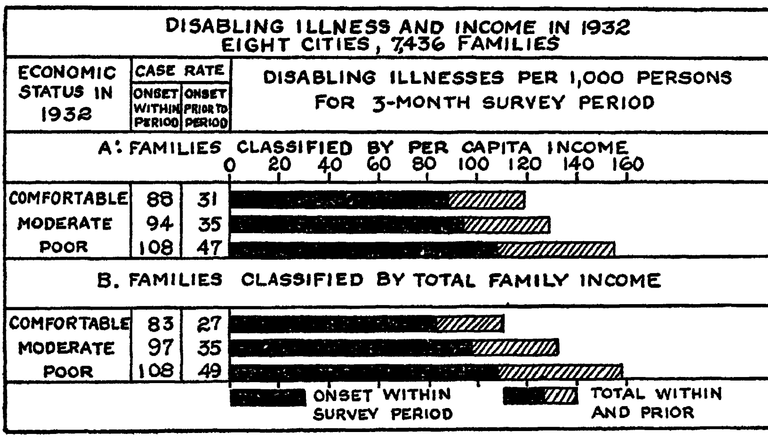


FIGURE 3.—Disabling illness in 8 large cities during a 3-month period in the early spring of 1933 in white wage-earning families classified according to (*a*) annual per capita income in 1932, and (*b*) annual total family income in 1932. (Ranges of income included as "comfortable", "moderate", and "poor" are given in footnote 8, page 608. Rates are adjusted for age.)

as in the grouping by employment status of the wage earners. Figure 3 shows the incidence of disabling illness among families in the 8 large cities grouped first according to per capita income and second according to total family income. By either classification the families in the lowest income groups show the highest rates of disabling illness. Thus the rate among families classified as "poor" is 23 percent higher in the grouping by per capita income and 30 percent higher in the

[7] The 2 rural industrial communities, while having a relatively high average illness rate, do not show the consistent association between economic status and illness which appears in the 8 large cities. This finding, for which there is no obvious explanation at the present time, has made it seem best to consider the large cities as a group for many tabulations and reserve the 2 rural communities for separate study.

grouping by total family income than the illness rate of families classified as "comfortable."[8] Illnesses with onset prior to the period, largely chronic, show an even greater excess among families with the lowest income.[9] Thus the poor group has an illness rate 50 percent higher than the comfortable group in the classification of families by per capita income and 80 percent higher than the comfortable group in the classification by total family income.

[8] For convenience, incomes have been grouped into ranges classified as "comfortable", "moderate", and "poor." *These terms have no significance other than as convenient labels for use in discussion.* The income ranges included in these groups are not the same for each city, due to differences in the averages and distributions of the incomes and the necessity for having groups of sufficient size for statistical significance. New York and Brooklyn, for example, had relatively few families with incomes under $600, and the "poor" group in those cities includes all families with incomes under $1,200. The need for the change in income class limits for certain of the localities is also indicated by higher and lower living costs in the communities concerned. Per capita income has been used in many of the tabulations because it represents economic status better than the total family income which takes no account of size of family. It was realized that for strict accuracy a figure taking account not only of the size of the family but also of the age and sex of its members, such as "income per adult male unit", might be better than income per capita. However, previous studies have shown excellent correlation between per capita income and these other derived units, and it was felt that the accuracy of the 4-year income record was not sufficient to justify the more refined calculations. The income ranges used in all charts and tables are as follows:

Income classification

City	Annual per capita income		
	Comfortable	Moderate	Poor
I. Baltimore, Birmingham, Cleveland, Detroit, Pittsburgh, and Syracuse	$425 and over	$150–$424	Under $150.
II. Brooklyn and New York City	$500 and over	$250–$499	Under $250.
III. Greenville and Morgantown	$300 and over	$150–$299	Under $150.

City	Annual total family income		
	Comfortable	Moderate	Poor
I. Baltimore, Birmingham, Cleveland, Detroit, Pittsburgh, and Syracuse	$1,600 and over	$600–$1,599	Under $600.
II. Brooklyn and New York City	$2,000 and over	$1,200–$1,999	Under $1,200.
III. Greenville and Morgantown	$1,200 and over	$600–$1,199	Under $600.

[9] This excess was not evident in the crude rates which were used in preliminary publications. The adjusted rate for illnesses having onset prior to the study period among the comfortable group is considerably lower than the crude rate, due to the fact that this group includes a relatively large proportion of older individuals with a high rate of chronic illness. Hence, with the effect of differences in age composition eliminated, the "poor" are shown to have a much higher rate of chronic illness than the "comfortable."

TABLE 7.—*Disabling illness in the early spring of 1933 and family income [1] in 1932 in white wage-earning families in each of 10 localities*

Locality	Disabling illness per 1,000 persons for 3-month survey period [2]							Cases of disabling illness						Population observed						
	All incomes	Classified by per capita income			Classified by total family income			Classified by per capita income			Classified by total family income			Total population	Classified by per capita income			Classified by total family income		
		Comfortable	Moderate	Poor	Comfortable	Moderate	Poor	Comfortable	Moderate	Poor	Comfortable	Moderate	Poor		Comfortable	Moderate	Poor	Comfortable	Moderate	Poor
Baltimore														4,442	381	2,261	1,800	654	2,544	1,244
Onset within	82.1	78	72	94	72	80	91	27	159	180	44	203	119							
Onset prior	54.0	47	47	66	36	52	67	25	110	109	25	132	87							
Birmingham														3,348	554	1,561	1,233	705	1,612	1,031
Onset within	100.6	92	105	99	83	111	97	47	162	127	55	178	103							
Onset prior	44.3	43	39	53	34	40	60	29	63	60	27	65	60							
Brooklyn														2,703	879	1,185	639	842	999	862
Onset within	93.7	80	94	110	78	91	111	65	108	70	62	88	93							
Onset prior	14.1	10	13	24	10	12	20	12	17	16	10	14	21							
Cleveland														4,415	425	1,690	2,300	513	1,891	2,011
Onset within	96.6	92	91	101	82	97	100	35	143	234	38	173	201							
Onset prior	36.8	19	37	42	22	29	49	11	71	86	13	58	97							
Detroit														4,555	452	1,809	2,294	609	2,066	1,880
Onset within	84.8	70	88	85	73	78	96	29	159	204	43	162	187							
Onset prior	39.7	27	40	43	33	36	46	15	71	85	21	72	78							
New York City														4,541	929	1,590	2,022	701	1,535	2,305
Onset within	122.4	102	109	140	102	116	132	84	165	293	64	172	306							
Onset prior	34.9	31	35	38	27	36	37	40	63	69	21	57	94							
Pittsburgh														3,460	506	1,374	1,580	635	1,552	1,273
Onset within	110.6	87	99	127	95	96	135	40	129	201	56	141	173							
Onset prior	43.1	35	37	54	32	39	56	27	57	79	26	67	70							
Syracuse														4,171	326	1,532	2,313	453	2,015	1,703
Onset within	101.5	106	96	105	78	105	104	31	140	246	32	206	179							
Onset prior	43.4	37	34	53	22	36	59	18	60	108	11	73	102							
Greenville														4,714	354	1,456	2,904	621	1,933	2,160
Onset within	122.4	122	111	128	78	134	124	37	163	405	46	267	292							
Onset prior	77.0	73	77	78	76	73	81	25	103	183	42	121	148							
Morgantown														3,835	302	915	2,618	492	1,472	1,871
Onset within	114.5	154	127	106	121	101	123	46	121	301	62	157	249							
Onset prior	34.8	22	33	38	19	35	39	7	26	77	8	43	59							
Total, 10 localities [3]														40,184	5,108	15,373	19,703	6,225	17,619	16,340
Onset within	102.9	98	99	110	86	101	111	441	1,449	2,261	502	1,747	1,902							
Onset prior	42.2	34	39	49	31	39	51	209	641	872	204	702	816							
Total, 8 large cities [4]														31,635	4,452	13,002	14,181	5,112	14,214	12,309
Onset within	90.0	88	94	108	83	97	108	358	1,165	1,555	394	1,323	1,361							
Onset prior	38.8	31	35	47	27	35	49	177	512	612	154	538	609							

[1] For definition of the groups "comfortable", "moderate", and "poor", see footnote 8, page 608.
[2] Adjusted for age.
[3] Illness rates are simple averages of rates in 10 localities.
[4] Excludes Greenville and Morgantown. Illness rates are simple averages of rates in 8 large cities.

In table 7 disabling illness rates are given for each of the 10 localities for families classified by per capita and by total income. In figure 4 for families classified by per capita income a disabling illness index (100 equals the disabling illness rate, adjusted for age, onset within and prior to the period, for the entire surveyed population in

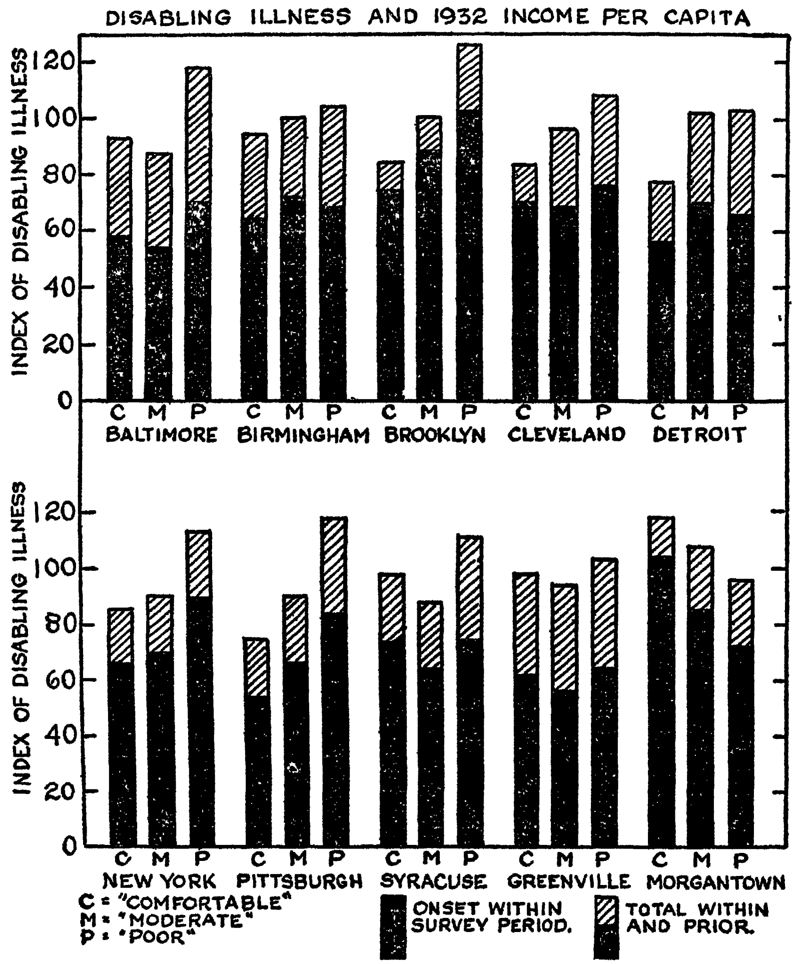


FIGURE 4.—Disabling illness in each of 10 localities during a 3-month period in the early spring of 1933 in white wage-earning families classified according to annual per capita income in 1932. (Illness rates, adjusted for age, are expressed as an index (100 equals the disabling illness rate, adjusted for age, onset within and prior to the survey period, for the entire canvassed population in the specified city. Ranges of income included as "comfortable", "moderate", and "poor" are given in footnote 8, page 608).)

the specified city) has been used instead of the actual rate. Considering illnesses having onset within and prior to the study period, sickness rates in the poor group (by per capita income) are consistently higher than in the comfortable group, with the exception of Morgantown. In the classification by total income, Morgantown

shows the same association with economic status as the other localities, the lowest income class having the highest sickness rates.[10]

ILLNESS EARLY IN 1933 AND INCOME CHANGE, 1929–1932

A correlation between sickness and low income is not confined to periods of depression. A high illness rate, high death rate, and high birth rate have always gone hand in hand with poverty.[11] It is obviously desirable, therefore, to ascertain whether the higher sickness rate among the poorer classes in the surveyed families was in any way associated with *changes* in standard of living. Tremendous shifts in economic status and standard of living took place during the depression. For example, of the 14,181 individuals in the eight large cities who were classified by per capita income as poor in 1932, only 25 percent were poor in 1929, 55 percent were moderate, and 20 percent were comfortable. An analysis of the relation between "depression history" and illness was made. For this purpose the individuals were divided into six categories according to economic status in 1929 and 1932, as follows:[12]

I. Individuals experiencing materially lowered family income between 1929 and 1932 were classified as—
1. Comfortable in 1929 and moderate in 1932.
2. Moderate in 1929 and poor in 1932.
3. Comfortable in 1929 and poor in 1932.

II. Individuals who had not experienced materially lowered income between 1929 and 1932 were classified as—
1. Comfortable in 1929 and 1932.
2. Moderate in 1929 and 1932.
3. Poor in 1929 and 1932.

Sickness data for these groups classified according to per capita income are given in figure 5. Inspection of the chart shows the significant and interesting fact that the highest illness rate is exhibited by the group hardest hit by the depression, namely, the group "comfortable in 1929 and poor in 1932." Considering disabling illnesses having onset within or prior to the survey period, this group,

[10] If the differences in illness rates between the comfortable and poor groups in the individual localities are tested for statistical significance, it is found that the differences are from 1 to 4 times their respective probable errors, which vary from 10 to 14 cases per 1,000 persons in the several localities. Thus in Birmingham and Syracuse, where the difference in illness rates (onset within and prior) between the comfortable and poor groups is 17 and 15 cases per 1,000, respectively, the association between economic status and illness is within the limits of chance variation. However, the probability of finding a *consistent* association between income and sickness in this number of cities, as a result of chance, is so small that the relation is unquestionably real. This applies also to the differences in illness rates observed among families grouped by employment status of wage earners (table 6) or by change in income between 1929 and 1932 (tables 8 and 9). Considering the average results for the 8 large cities, the poor group exhibited a rate of disabling illness, onset within and prior, which was 36 cases per 1,000 above that of the comfortable group. The probable error of this difference is 4 cases per 1,000; thus the actual difference observed is 9 times its probable error.

[11] See Public Health Bulletin 165, Economic Status and Health (Govt. Printing Office, Wash., 1927), for a summary of data bearing on the association of illness and death rates with economic status

[12] Ranges of income included as "comfortable", "moderate", and "poor" are given in footnote 8, p. 608.

with a rate of 174 cases per 1,000 persons, showed an incidence of illness that was 45 percent higher than the rate (120 per 1,000) for their more fortunate neighbors who were equal in status in 1929 but suffered no drop in income by 1932; that is, the "comfortable in 1929 and 1932." [13] The group that had dropped from comfortable to moderate showed a 10 percent higher disabling illness rate than the comfortable group that had experienced no drop in income. The group that had dropped from moderate to poor showed a 17 percent higher illness rate than those who were in moderate circumstances throughout the 4 years. It is interesting to note that the rate for

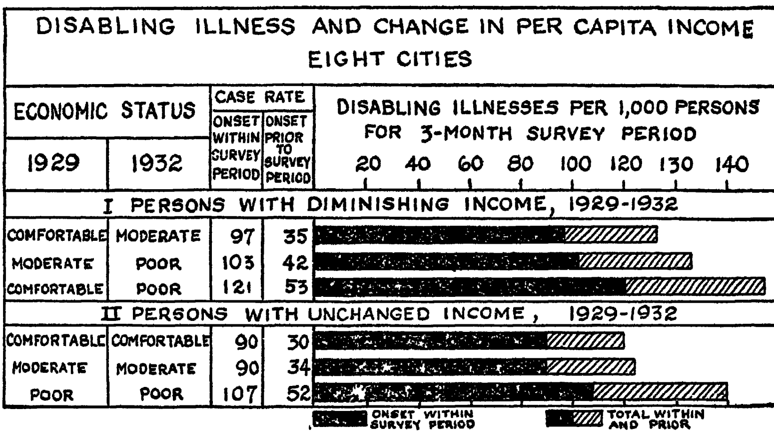


FIGURE 3.—Disabling illness in 8 large cities during a 3-month period in the early spring of 1933 in white wage-earning families classified according to change in per capita income, 1929–1932. (Ranges of income included as "comfortable", "moderate", and "poor" are given in footnote 8, page 608. Rates are adjusted for age.)

the group that had dropped in income from comfortable to poor was 9 percent higher than that of the chronic poor, that is those who were poverty stricken even in 1929—a finding which suggests that illness is associated with sudden change in standard of living.

[13] In preliminary tabulations a larger number of income groups was used, each group including a narrow range of incomes. It was found, however, that the broad groups finally used were adequate. For example, the "comfortable" class ($425 and over by per capita income) was divided into 3 groups, (1) $425–$499, (2) $500–$749, and (3) $750 and over. It was found that the illness rates among families that had dropped in income from either of these classes into the "poor" group were similar and were all higher than in families that remained in either of the three classes from 1929 to 1932. Similar subdivision of the "moderate" and "poor" groups was made and found not to change the general picture as presented in this paper.

TABLE 8.—*Disabling illness in the early spring of 1933 and change in annual* ***per capita income,***[1] *1929–32, in white wage-earning families in each of 10 localities*

	Disabling illness per 1,000 persons for 3-month survey period [2]						Cases of disabling illness						Population observed						
Per capita income:[1] 1929	Comfortable	Moderate	Comfortable	Comfortable	Moderate	Poor	Comfortable	Moderate	Comfortable	Comfortable	Moderate	Poor	Total	Comfortable	Moderate	Comfortable	Comfortable	Moderate	Poor
1932	Moderate	Poor	Poor	Comfortable	Moderate	Poor	Moderate	Poor	Poor	Comfortable	Moderate	Poor		Moderate	Poor	Poor	Comfortable	Moderate	Poor
Baltimore													4,374	895	1,086	340	351	1,328	374
Onset within	76	89	117	82	67	89	66	104	41	26	87	35							
Onset prior	45	56	78	45	48	84	46	53	29	22	62	27							
Birmingham													3,316	948	720	322	536	599	191
Onset within	123	98	118	93	78	73	116	75	38	46	46	14							
Onset prior	43	49	50	43	30	72	43	31	17	28	18	12							
Brooklyn													2,565	572	327	162	783	571	150
Onset within	127	110	60	79	60	162	73	35	10	57	32	25							
Onset prior	10	16	39	10	15	26	7	5	7	11	9	4							
Cleveland													4,333	814	1,179	467	402	817	654
Onset within	85	85	128	87	94	111	69	102	60	31	70	72							
Onset prior	41	34	49	18	32	50	40	35	23	10	29	28							
Detroit													4,457	1,067	1,259	590	415	681	445
Onset within	73	87	98	73	109	62	79	112	64	28	73	28							
Onset prior	38	38	48	29	41	54	41	40	25	15	26	20							
New York City													4,411	731	939	334	846	812	749
Onset within	117	142	138	106	102	140	82	139	48	80	79	106							
Onset prior	23	44	23	31	41	37	24	37	8	37	36	24							
Pittsburgh													3,373	681	881	307	483	629	392
Onset within	84	119	176	90	108	108	54	107	53	40	66	41							
Onset prior	36	57	57	35	35	45	30	44	20	26	23	15							
Syracuse													4,087	632	1,378	298	301	841	637
Onset within	89	95	136	111	99	111	54	133	42	30	79	71							
Onset prior	37	47	77	33	32	51	30	54	26	15	29	28							
Greenville													4,624	844	1,392	756	317	559	756
Onset within	130	131	129	132	89	120	113	201	107	36	48	97							
Onset prior	72	70	66	65	87	105	58	78	43	20	42	62							
Morgantown													3,797	649	1,042	750	291	239	826
Onset within	109	111	112	125	151	94	77	125	95	36	34	81							
Onset prior	31	39	48	23	28	26	19	32	28	7	6	17							
Total, 10 localities [3]													39,337	7,833	10,203	4,326	4,725	7,076	5,174
Onset within	102	107	121	98	96	107	783	1,133	558	410	614	570							
Onset prior	38	45	54	33	39	55	338	409	226	191	280	237							
Total, 8 large cities [4]													30,916	6,340	7,769	2,820	4,117	6,278	3,592
Onset within	97	103	121	90	90	107	593	807	356	338	532	392							
Onset prior	35	42	53	30	34	52	261	299	155	164	232	158							

[1] For definition of the groups "comfortable", "moderate", and "poor", see footnote 8, p. 608.
[2] Adjusted for age.
[3] Excludes 847 persons in families with rising income, 1929–32. Illness rates are simple averages of rates in the 10 localities.
[4] Excludes Greenville and Morgantown. Excludes 719 persons in families with rising income, 1929–32. Illness rates are simple averages of rates in the 8 large cities.

TABLE 9.—*Disabling illness in the early spring of 1933 and change in annual* **total family income,**[1] *1929–32, in white wage-earning families in each of 10 localities*

Total family income:[1] 1929	Disabling illness per 1,000 persons for 3-month survey period[2]						Cases of disabling illness						Population observed						
1929	Comfortable	Moderate	Comfortable	Comfortable	Moderate	Poor	Comfortable	Moderate	Comfortable	Comfortable	Moderate	Poor	Total	Comfortable	Moderate	Comfortable	Comfortable	Moderate	Poor
1932	Moderate	Poor	Poor	Comfortable	Moderate	Poor	Moderate	Poor	Poor	Comfortable	Moderate	Poor		Moderate	Poor	Poor	Comfortable	Moderate	Poor
Baltimore													4,356	1,187	787	341	610	1,315	116
Onset within	61	81	113	69	92	97	73	69	39	39	125	11							
Onset prior	51	72	62	34	47	57	63	55	22	22	59	10							
Birmingham													3,299	1,131	507	364	653	454	160
Onset within	125	117	81	81	82	63	141	63	30	52	37	10							
Onset prior	42	68	41	35	31	75	49	32	15	27	14	13							
Brooklyn													2,580	470	429	237	767	481	196
Onset within	89	107	89	78	96	146	40	46	20	56	45	27							
Onset prior	15	20	11	10	11	29	8	10	3	9	6	8							
Cleveland													4,295	1,019	1,054	603	457	808	354
Onset within	95	92	101	85	103	123	91	99	59	35	79	43							
Onset prior	33	43	54	23	26	57	35	43	32	12	22	22							
Detroit													4,461	1,277	877	746	570	734	257
Onset within	72	89	104	76	88	94	93	82	81	43	65	24							
Onset prior	38	45	35	35	34	79	47	35	23	21	23	20							
New York													4,387	629	934	568	622	831	803
Onset within	95	130	117	95	130	145	55	125	65	53	108	116							
Onset prior	28	31	34	28	41	44	18	29	21	20	35	44							
Pittsburgh													3,371	878	760	354	591	629	159
Onset within	86	128	174	89	97	86	71	100	60	49	59	13							
Onset prior	42	53	57	33	32	46	41	41	21	25	22	8							
Syracuse													4,034	893	972	429	416	1,022	302
Onset within	99	105	102	82	111	101	85	105	43	31	112	31							
Onset prior	41	55	50	23	30	74	37	55	22	11	32	25							
Greenville													4,645	1,271	1,155	747	590	624	258
Onset within	131	130	119	80	136	108	167	170	92	45	92	30							
Onset prior	68	76	75	74	75	118	77	72	50	39	37	26							
Morgantown													3,712	1,049	835	697	439	353	339
Onset within	102	127	121	112	104	116	114	115	92	51	38	42							
Onset prior	36	34	46	21	30	35	31	23	26	8	9	10							
Total, 10 localities[3]													39,140	9,804	8,310	5,086	5,745	7,251	2,944
Onset within	96	111	112	55	104	108	930	974	581	453	760	347							
Onset prior	39	51	47	32	36	61	406	395	235	194	259	186							
Total, 8 large cities[4]													30,783	7,484	6,320	3,642	4,716	6,274	2,347
Onset within	91	106	110	82	100	107	649	689	397	357	630	275							
Onset prior	36	49	43	23	31	58	298	300	159	147	213	150							

[1] For definition of the groups "comfortable", "moderate", and "poor", see footnote 8, p. 608.
[2] Adjusted for age.
[3] Excludes 1,044 persons in families with rising income, 1929–32. Illness rates are simple averages of rates in the 10 localities.
[4] Excludes Greenville and Morgantown. Excludes 852 persons in families with rising income, 1929–32. Illness rates are simple averages of rates in the 8 localities.

In figure 6, the results for each of the 10 localities are shown for 2 economic groups classified by per capita income in 1929 and 1932, (*a*) comfortable in 1929 and 1932, (*b*) comfortable in 1929 and poor in 1932. With the exception of Greenville, a higher illness rate is exhibited in each locality by the group that had dropped from comfortable to poor than by the one that remained in the comfortable

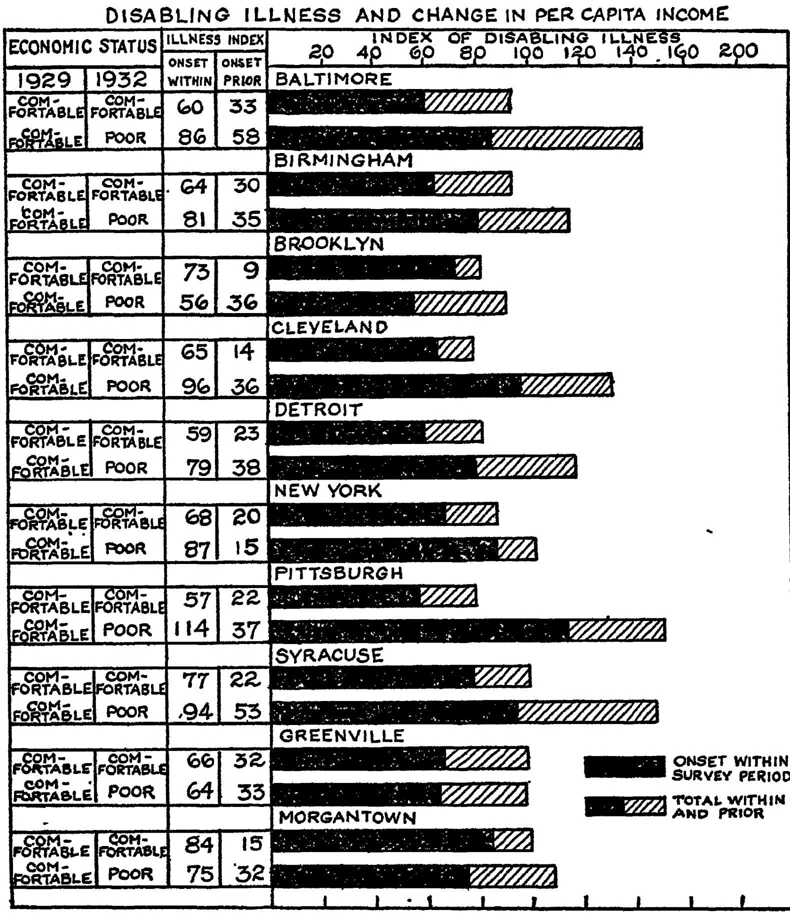


FIGURE 6.—Disabling illness in each of 10 localities during a 3-month period in the early spring of 1933 in white wage-earning families classified as "comfortable in 1929 and 1932" and "comfortable in 1929 and poor in 1932". (Illness rates, adjusted for age, are expressed as an index (100 equals the disabling illness rate adjusted for age, onset within and prior to the survey period, for the entire canvassed population in the specified city). Ranges of income included as "comfortable" and "poor" are given in footnote 8, page 608.)

class for the 4 years. In table 8 disabling illness rates are given for all of the economic groups classified by 1929 and 1932 income per capita; and in table 9 illness rates are given for families grouped by total income in 1929 and 1932. Classification by total family income gives, in general, the same sequences as classification by per capita income.

ILLNESS EARLY IN 1933 AND RELIEF STATUS IN 1932

In 1932, in the 8 large cities 20 percent of the surveyed families received public or private relief for all or part of the year. The proportion on relief varied from 4 percent in Brooklyn to 30 percent in Syracuse (table 1). At that time (1932 and 1933) eligibility for relief indicated that a family was in very dire straits. These relief families had the lowest standards of living of any in the surveyed group. It will be of interest to compare their illness record with that of families not on relief.

Relief families were nearly all in the group classified as poor in 1932 (footnote 8, p. 608). Hence only this group has been separated into relief and nonrelief classes. In figure 7, rates of disabling illness are shown for individuals classified by economic status in 1929 and 1932

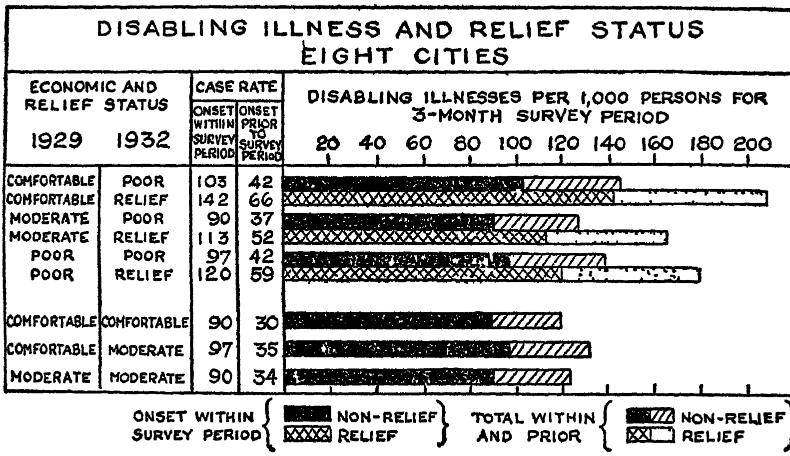


FIGURE 7.—Disabling illness in 8 large cities during a 3-month period in the early spring of 1933 in white wage-earning families classified according to change in per capita income, 1929–32, and relief status in 1932. (Ranges of income included as "comfortable", "moderate", and "poor" are given in footnote 8, page 608. Rates are adjusted for age.)

with the groups that were poor in 1932 classed as (1) poor but not on relief and (2) poor and on relief. It is seen that individuals in families on relief have a higher incidence of disabling illness than any of the other groups of the surveyed population, whatever their economic history during the depression. Thus, the group that dropped from the comfortable class in 1929 to relief in 1932 exhibits an illness rate (within plus prior) 44 percent higher than that of the group that fell from comfortable to poor but not on relief and 73 percent higher than that of the group that was comfortable in 1929 and 1932. Among relief families, the income change between 1929 and 1932 is associated with illness in the same manner as for families not on relief; that is, the families that suffered the greatest change in economic status exhibit the highest illness rate.

In figure 8, illness rates for each of the 8 large cities are shown for 3 groups of families: (1) Comfortable in 1929 and 1932; (2) comfortable in 1929 and poor in 1932; and (3) comfortable in 1929 and on relief in 1932. To facilitate comparisons, a disabling illness index is used instead of the actual illness rate. With the exception of Brooklyn and Birmingham, the highest illness rate is shown by the group that was comfortable in 1929 but on relief in 1932. In Brooklyn the group on relief was too small to give illness rates of statistical signifi-

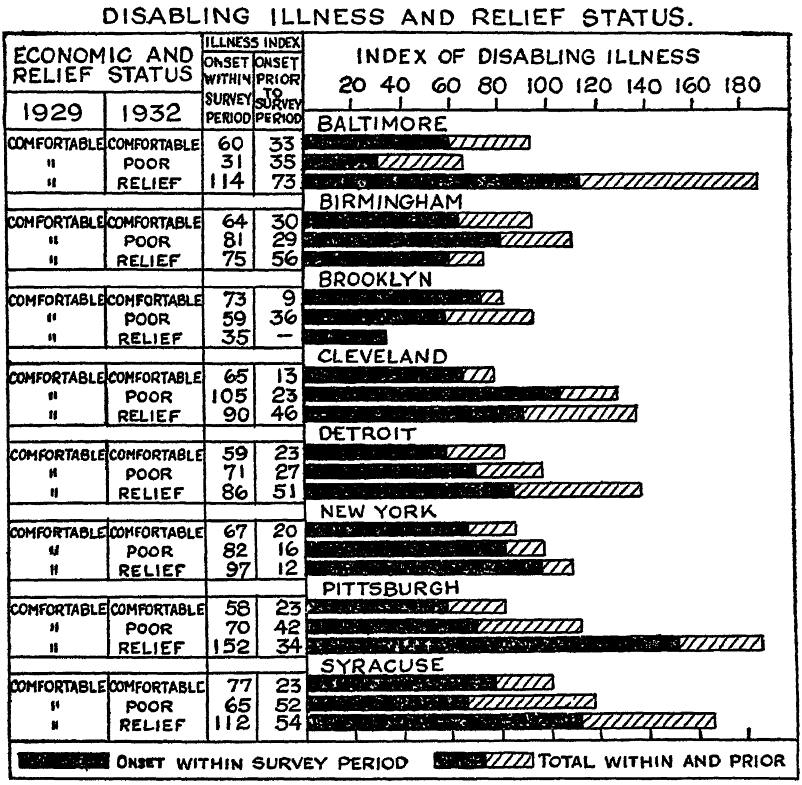


FIGURE 8.—Disabling illness in each of 8 localities during a 3-month period in the early spring of 1933 in white wage-earning families classified as "comfortable" in 1929 and (1) "comfortable", (2) "poor" and (3) "on relief" in 1932. (Illness rates, adjusted for age, are expressed as an index (100 equals the disabling illness rate, adjusted for age, onset within and prior to the survey period, for the entire canvassed population in the specified city). Ranges of income included as "comfortable" and "poor" are given in footnote 8, page 608.)

cance. In the other cities except Baltimore the group comfortable in 1929 and poor but not on relief in 1932 exhibits a lower illness rate than the relief group but higher than the group which was comfortable in 1929 and 1932. In all of the 8 cities except Baltimore the group which was comfortable in 1929 and poor but not on relief in 1932 has a higher illness rate than the class which was comfortable in 1929 and 1932. Results for the relief and nonrelief groups are given in detail in table 10.

TABLE 10.—*Disabling illness in the early spring of 1933 as associated with change in annual per capita income,[1] 1929–32, and relief status, 1932, among white wage-earning families in each of 8 large cities*

Per capita income and relief status: 1929	Disabling illnesses per 1,000 persons for 3-month survey period [2]						Cases of disabling illness						Population observed					
	Comfortable		Moderate		Poor		Comfortable		Moderate		Poor		Comfortable		Moderate		Poor	
1932	Poor	Relief	Poor	Relief	Poor	Relief	Poor	Relief	Poor	Relief	Poor	Relief	Poor	Relief	Poor	Relief	Poor	Relief
Baltimore													122	218	529	557	160	214
Onset within	42	155	78	98	69	102	5	36	43	61	11	24						
Onset prior	48	99	46	66	96	76	7	22	23	30	14	13						
Birmingham													239	79	447	272	91	100
Onset within	118	109	105	86	101	49	23	9	50	25	9	5						
Onset prior	42	81	44	57	74	69	11	6	18	13	6	6						
Brooklyn													139	24	294	35	135	16
Onset within	64	38	112	89	154	214	9	1	32	3	21	4						
Onset prior	39		18		21	70	6		5		3	1						
Cleveland													210	252	604	552	309	333
Onset within	140	120	74	100	106	120	28	32	43	59	31	41						
Onset prior	31	62	33	35	38	61	7	15	18	16	10	18						
Detroit													287	301	549	704	181	264
Onset within	89	107	55	111	45	74	28	36	30	82	8	20						
Onset prior	34	63	36	40	46	58	9	16	17	23	7	13						
New York													220	114	650	259	404	330
Onset within	129	153	122	186	120	165	29	19	81	58	48	57						
Onset prior	25	19	41	60	31	40	6	2	24	13	11	11						
Pittsburgh													149	158	419	462	215	177
Onset within	103	234	115	122	69	154	15	38	47	60	14	27						
Onset prior	64	52	38	74	49	39	11	9	15	28	9	6						
Syracuse													113	182	733	645	266	371
Onset within	94	162	75	113	97	121	11	31	55	76	25	46						
Onset prior	76	79	35	54	23	71	10	16	22	29	5	23						
Total, 8 cities [3]													1,479	1,328	4,225	3,516	1,761	1,805
Onset within	103	142	90	113	97	120	153	202	381	424	167	224						
Onset prior	42	66	37	52	42	59	67	86	142	152	65	91						

[1] For definition of the groups "comfortable", "moderate", and "poor" see footnote 8, p. 608.
[2] Adjusted for age.
[3] Weighted average.

DISCUSSION OF RESULTS

The general result is clearly shown, by surveys of samples of the poorer sections of eight large cities, that wage-earning families reduced to poverty during the depression suffered to a greater extent from disabling illness in 1933 than their more fortunate neighbors. Individuals in families supported by public or private relief exhibited a higher illness rate than any other group. This finding was true for children as well as for adults and in general for respiratory and nonrespiratory illnesses, with the exception of the communicable diseases of childhood.[14] Whatever the implications of the results, the fact remains that illness was most prevalent among those who could least afford this handicap.

However, the survey data raise the question of the relative importance of nurture and nature in bringing about the observed results. In other words, did reduced standard of living cause *increase* of illness among the new poor between 1929 and 1933 or were they more sickly than their neighbors even in 1929? Have we observed the *effect* of the depression on health or merely the results of a great sifting process?

In considering factors that may have brought about the situation in which a group of families characterized by a newly acquired poverty reported a relatively high illness rate, the methodology of the survey must be borne clearly in mind. All sickness data are for a 3-month period early in 1933 with no data for 1929 or other years; the economic data cover the years 1929 to 1932. If we find, as has been shown, a higher illness rate among the depression poor than existed among families remaining in the comfortable class for all 4 years, then it seems reasonable to suppose that reduced standard of living, including crowded housing conditions and lack of adequate food and clothing and medical care, which accompanied this loss of income, had a part in *causing* this higher sickness rate in 1933.

However, other factors may have played a part:[15]

(1) Unemployment of wage earners due to sickness probably contributed to the loss in income of certain families; these persons may have been concentrated in the group that suffered economic reverses during the depression and have been responsible for at least a part of the high illness rate in this group. However, analysis of the data shows this to be a relatively unimportant factor. Individuals unemployed due to sickness were not concentrated among the new poor, and, furthermore, the same excess in sickness rates was observed in this group when all families were excluded in which there was unem-

[14] A forthcoming paper will analyze the results by age and by type of illness.

[15] Knowingly false or unconsciously exaggerated reporting of illness by the poorer groups of the population does not appear to be a factor in the results observed, because the observed variation of illness with age, sex, and diagnosis agrees with other known data. Only an omniscient housewife could *invent* this complicated pattern.

ployment due to sickness at any time between 1929 and 1932 (prior to the survey period).

(2) The depression may have been a sifting process, separating the fit from the unfit. In spite of innumerable exceptions, the men who kept their jobs were, on the average, the more vigorous, capable, and intelligent ones. Moreover, with many exceptions, those who lost their jobs were less efficient than those who remained employed. This inefficiency may have been exhibited in many ways distinct from inability to compete in the economic struggle—perhaps a diathesis or tendency toward sickliness existed among these families as a concomitant of the economic inefficiency of the wage earner. This explanation of the higher sickness rates among the new poor does not assume sickness *per se* as a cause of unemployment, but postulates an inherent inferiority of which unemployment was one manifestation and ill health another. According to this hypothesis, the "new poor" would have exhibited a high illness rate even in 1929 (if they could have been singled out for observation), and their lowered standard of living during the depression was not the prime cause of their high illness rate.

The writers admit the possibility that selection played a part in bringing about the situation observed in 1933, but it does not seem probable that selection of the less fit by the depression screen is the whole story. Undoubtedly, those who became unemployed during the depression were, on the average, the least well equipped to compete in the keen struggle for jobs. For example (table 11), when we compare the "new poor" in the surveyed group with those who remained comfortable throughout the depression, we find that they had fewer household heads with high school or college education, fewer in the white-collar occupations in 1929, that they lived in more crowded living quarters even in 1929, and exhibited a higher birth rate. Some of these findings appear to indicate that families of certain *types* were least successful in weathering the depression. However, it seems highly improbable that a theory of selection contains the sole explanation of the results of the present survey. As a matter of fact, when illness rates are made specific for age, sex, race, education, occupation, and relief status, the association between drop in income and high illness rate is still evident.

A study now being made of the death rate among families who became unemployed during the depression will throw further light on the question, because it is possible to obtain information on deaths for a number of years prior to the canvass, which is not feasible in a sickness survey. Hence, *trends* in the death rate from 1929 to the present time can be studied for groups of families that had various types of economic history during the depression. Preliminary results indicate a rise in the death rate between 1929 and 1933 among families in which the wage-earner became unemployed during this period.

TABLE 11.—*Characteristics of white wage-earning families classified according to per capita income change, 1929–32: 5 cities surveyed early in 1933* [1]

	Comfortable in 1929 and 1932 [2]	Comfortable in 1929, poor in 1932 [2]	Poor in 1929 and 1932 [2]
Percentage of all families:			
With full-time workers, 1929	89.4	88.3	33.1
With full-time workers, 1932	72.7	7.0	19.7
With no employed workers, 1932	.7	36.8	34.6
With chief wage-earner in white-collar occupation in 1929	33.4	9.6	13.0
On relief, 1929	.0	.6	14.7
On relief, 1932	.7	55.9	55.9
With household head native of native parents	44.3	43.3	26.3
With household head having high school or college education	27.9	19.4	7.2
With unemployment due to sickness, 1931–32	6.3	6.0	9.1
Persons per family, 1933	2.8	4.0	6.1
Persons per room, 1929	.54	.78	1.21
Persons per room, 1933	.55	.93	1.27
Annual birth rate [3] per 1,000 married women, aged 15–44 years, 1929–32	107	133	178
Disabling illness per 1,000 persons for 3-month period [4]	119	185	153

[1] Baltimore, Cleveland, Detroit, Pittsburgh, and Syracuse.
[2] For definition of groups "comfortable" and "poor", see footnote 8, p. 608.
[3] Total family income was used in classifying families for birth-rate tabulation. "Comfortable" indicates annual family income of $2,000 and over; "poor", under $1,200. (Rates adjusted for age.)
[4] Adjusted for age.

The facts that the excess in illness rates appears among children as well as adults and that the highest illness rates are exhibited by families that had dropped from the highest level in 1929 appear to point to a definite causal relation between lowered standard of living and high illness rate. But whatever the cause, the result of the depression has been to present to society for support a group of some 20 million persons in the United States who are on relief rolls and among whom sickness is probably more prevalent than in the rest of the population. It must be recognized that medical care and preventive services for these persons are a necessity of life as well as food, clothing, and shelter. These necessities must be made available to all if the health of the wage-earning population is to be maintained.

SUMMARY

Records of illness during a 3-month period early in 1933 and economic history from 1929 to 1932 have been collected from about 12,000 wage-earning families in the poorer sections of 8 large cities, a group of coal-mining communities, and a group of cotton-mill villages. This paper, the first of a series dealing with the investigation, presents the method of the study and general results for each locality.

Tremendous changes in economic status and standard of living took place among the surveyed families during the depression. The median income of the group in the 8 large cities dropped from $1,650 in 1929 to $870 in 1932. In 17 percent of the families the chief wage earner was without employment in 1932; in 10 percent of the families all wage earners were unemployed that year. Public and private relief agencies contributed to the support of 20 percent of the families for part or all of 1932.

Disabling illness was found to be 48 percent higher among families having no employed wage earners in 1932 than in families having full-time workers. The group of families that had dropped from fairly comfortable circumstances to relief rolls during the depression showed a rate of disabling illness 73 percent higher than that of their more fortunate neighbors who had remained in the comfortable class throughout the 4 years. The higher sickness rates were observed in general in each of the 8 large cities as well as in the group as a whole. No consistent association between illness and economic status was found in the two rural industrial communities. Insofar as disabling illness is evidence of ill health, the results of the survey show that families hardest hit by the depression suffered to a greater extent from ill health in 1933 than others who had weathered the depression more successfully.

While concentration of the less fit in the ranks of the unemployed may have played a part in bringing about the situation observed in 1933, it does not seem probable that selection is the whole story. Particularly significant are the facts that the highest illness rates were observed among those who had suffered the greatest *change* in standard of living and that the excess in illness existed among children as well as adults. Whatever the cause, the fact remains that illness was most prevalent among families reduced to poverty and on relief rolls, who could least afford this handicap.

In forthcoming papers analysis of illnesses will be made by cause, by age and sex, and by social status of the families as indicated by such items as nativity, education, and occupation of the household head. The broad implications of the results will be discussed further after these data shall have been presented.

BACTERIAL CONTENT OF THE KANSAS DUST STORM ON MARCH 20, 1935

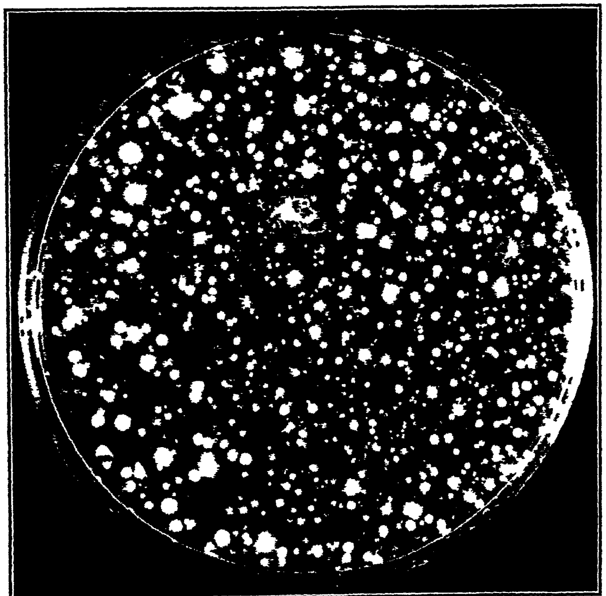
By Cassandra Ritter, *Bacteriologist, Division of Sanitation, Kansas State Board of Health, Lawrence, Kans.*

On March 20, 1935, there occurred a dust storm of unusual intensity, and the number of bacteria present, both outside and inside the laboratory, seemed to be a matter of such interest that they were determined by a simple experiment.

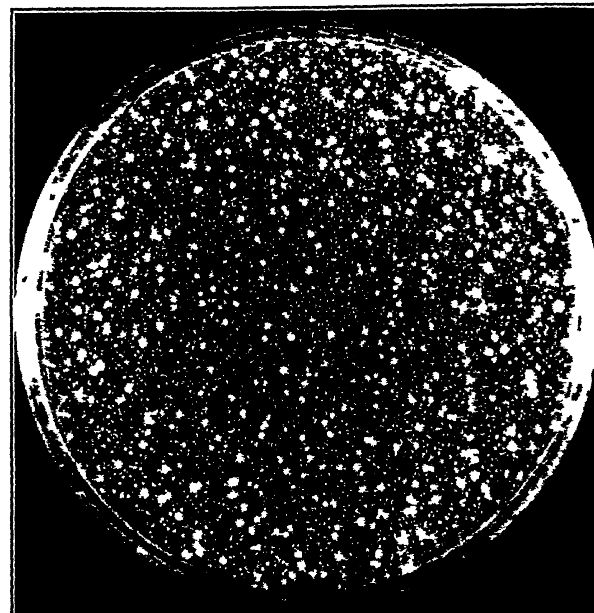
Petri dishes were prepared with sterile nutrient agar culture media. After the agar had hardened, the tops of the dishes were removed for certain lengths of time, which allowed the surface of the agar to become seeded with particles of dust. The plates were then incubated at 37° C. for 24 hours.

The outside exposures were made at the south entrance of Marvin Hall, University of Kansas, at Lawrence, where there was no obstruction to the wind. The exposures were made between 3 and 3:20

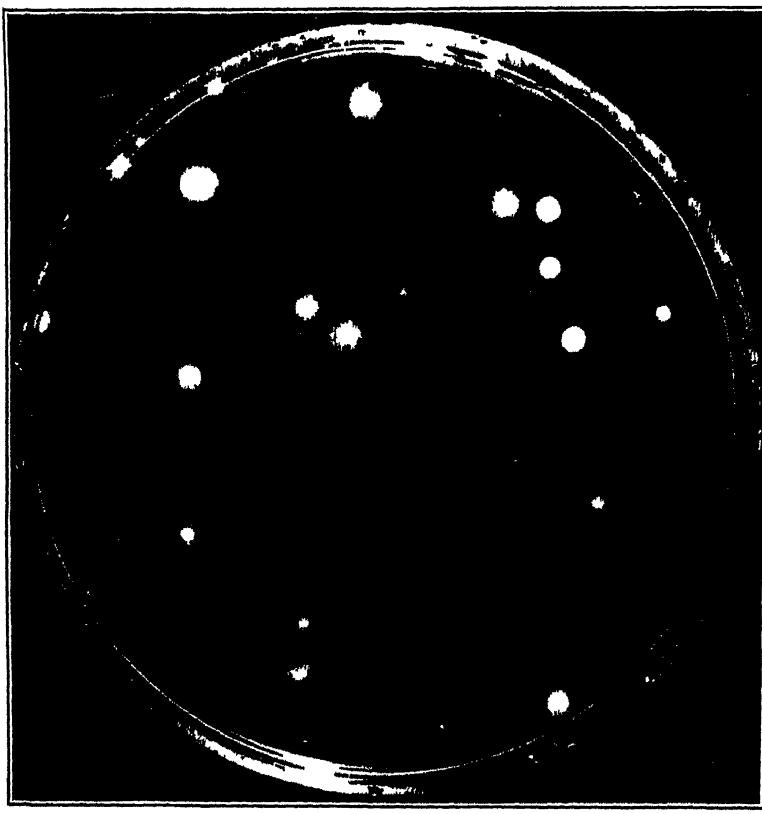
PLATE I



March 20, 1935 Exposure 30 seconds



March 20, 1935 Exposure 5 minutes



March 25, 1935 Exposure, 5 minutes

o'clock in the afternoon, after the storm had been in progress for several hours. Exposure times were 15 and 30 seconds, and 1, 1½, 2, 3, 5, and 10 minutes. In the laboratory, plates were exposed for 20 seconds and for 1 minute, and a control plate was not exposed.

It was possible to count the colonies on only a few plates. Those with longer exposures were not only too crowded, but it was obvious that all the organisms falling on the surface did not have a chance to develop. The counts that could be made were as follows:

15 seconds, duplicate plates	600 and 650 bacteria colonies.
30 seconds	1,100 bacteria colonies.
20 seconds, inside exposure	56 bacteria colonies.
1 minute, inside exposure	95 bacteria colonies.
Control plate, inside exposure	28 bacteria colonies.

As a matter of interest, the number of bacteria falling on 1 square foot per minute was computed. Using the number 600 falling on a Petri dish of measured area in 15 seconds, we calculated 31,000 bacteria per square foot per minute.

The colonies of bacteria on the plates appeared very similar to those formed by soil organisms, some of which will appear on plates made from raw waters. This was borne out by a microscopical examination of a number of colonies. Of 11 colonies examined, all but 2 had formed spores in 24 hours; they were all rather large bacillus forms, and most of them were Gram-positive. No coccus forms were found, either in that or later microscopical examinations. This strongly indicated that the bacteria surviving in the dust were resistant soil types.

In order to show the contrast between the number of bacteria present in the air during the dust storm and the number normally present, plates were exposed in the same location and at the same time on March 25. The day at the time of exposure, 3 o'clock, was clear and calm, although dust clouds had been visible in the morning. Plates exposed 1 minute and 5 minutes showed counts of 12 and 30, respectively. A plate exposed inside for 1 minute showed a count of 12.

DEATHS DURING WEEK ENDED APRIL 13, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Apr. 13, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	8,438	8,874
Deaths per 1,000 population, annual basis	11.8	12.4
Deaths under 1 year of age	579	675
Deaths under 1 year of age per 1,000 estimated live births	53	63
Deaths per 1,000 population, annual basis, first 15 weeks of year	12.7	12.6
Data from industrial insurance companies:		
Policies in force	67,734,319	67,698,617
Number of death claims	13,248	14,298
Death claims per 1,000 policies in force, annual rate	10.2	11.0
Death claims per 1,000 policies, first 15 weeks of year, annual rate	10.8	11.1

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Apr. 20, 1935, and Apr. 21, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 20, 1935, and Apr. 21, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 20, 1935	Week ended Apr. 21, 1934	Week ended Apr. 20, 1935	Week ended Apr. 21, 1934	Week ended Apr. 20, 1935	Week ended Apr. 21, 1934	Week ended Apr. 20, 1935	Week ended Apr. 21, 1934
New England States:								
Maine		1	8		109	14	0	0
New Hampshire					2	167	0	1
Vermont	2				46	53	0	0
Massachusetts	3	14			453	1,953	3	2
Rhode Island	2			2	343	3	1	0
Connecticut	2	1	6	2	1,065	52	1	1
Middle Atlantic States:								
New York	33	62	[1] 9	[1] 10	3,156	1,227	24	1
New Jersey	12	16	15	16	1,211	657	3	0
Pennsylvania	35	36			3,041	4,033	6	3
East North Central States:								
Ohio	49	31	19	14	1,540	1,207	11	4
Indiana	20	15	22	14	365	1,073	4	1
Illinois	29	31	46	21	3,107	1,813	23	15
Michigan	5	17	2	1	6,458	251	5	2
Wisconsin	1	3	6	24	1,555	1,505	1	2
West North Central States:								
Minnesota	6	3	3		615	231	1	0
Iowa	8	11	3	4	537	210	4	0
Missouri	44	34	103	49	776	936	8	4
North Dakota	5	1	13	2	31	152	0	0
South Dakota	6	3	1		68	336	0	0
Nebraska	5	1		10	365	232	0	0
Kansas		9	8	2	1,372	510	2	0
South Atlantic States:								
Delaware	1	1			13	102	0	0
Maryland	5	9	7	8	49	1,909	6	0
District of Columbia	15	7	2	2	92	226	5	2
Virginia	11	18			735	1,400	7	2
West Virginia	17	19	37	64	317	89	1	8
North Carolina	11	16	10	17	228	2,298	1	1
South Carolina	6	7	157	372	39	708	1	0
Georgia [2]	4	6				592	0	1
Florida	2	9	2	2	81	1,157	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 20, 1935, and Apr. 21, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 20, 1935	Week ended Apr. 21, 1934	Week ended Apr. 20, 1935	Week ended Apr. 21, 1934	Week ended Apr. 20, 1935	Week ended Apr. 21, 1934	Week ended Apr. 20, 1935	Week ended Apr. 21, 1934
East South Central States:								
Kentucky	16	9	20	6	514	185	4	1
Tennessee	5	5	40	39	19	816	6	0
Alabama	12	17	73	53	214	881	2	1
Mississippi [3]	1	6					2	0
West South Central States:								
Arkansas	4	1	18	7	70	65	1	3
Louisiana [2]	19	18	4	6	35	340	0	1
Oklahoma [4]	11	5	58	39	91	240	4	0
Texas [2]	36	79	301	169	185	942	6	2
Mountain States:								
Montana	2	1	27	110	600	40	0	0
Idaho [5]	1		3	2	4	36	0	0
Wyoming [5]	2	3			120	90	0	0
Colorado	5	3			233	352	1	1
New Mexico	3	2	6	2	27	162	0	0
Arizona		3	9	14	23	58	2	0
Utah [1]	3			5	10	256	0	0
Pacific States:								
Washington	1	5			342	196	3	2
Oregon [5]	7		33	37	205	87	1	0
California	30	42	62	36	1,413	942	4	3
Total	497	580	1,133	1,161	32,046	30,943	154	64
First 16 weeks of year	10,985	13,021	96,179	40,248	420,741	108,544	2,138	903

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 20, 1935	Week ended Apr. 21, 1934	Week ended Apr. 20, 1935	Week ended Apr. 21, 1934	Week ended Apr. 20, 1935	Week ended Apr. 21, 1934	Week ended Apr. 20, 1935	Week ended Apr. 21, 1934
New England States:								
Maine	0	0	6	11	0	0	1	1
New Hampshire	0	0	9	12	0	0	0	0
Vermont	0	0	7	11	0	0	0	0
Massachusetts	0	0	237	225	0	0	5	3
Rhode Island	0	0	7	22	0	0	0	0
Connecticut	0	0	110	91	0	0	0	0
Middle Atlantic States:								
New York	0	0	1,241	874	0	0	10	8
New Jersey	2	0	173	212	0	0	0	4
Pennsylvania	0	0	548	741	0	0	3	11
East North Central States:								
Ohio	1	1	773	706	3	0	5	5
Indiana	0	0	168	169	0	0	2	7
Illinois	0	2	1,251	610	0	5	18	4
Michigan	0	1	352	803	0	1	2	1
Wisconsin	0	0	410	212	14	50	2	2
West North Central States:								
Minnesota	0	1	339	66	0	7	0	1
Iowa	0	0	81	55	18	4	0	0
Missouri	0	1	69	95	2	7	4	8
North Dakota	0	0	66	24	0	0	0	0
South Dakota	0	0	8	4	5	6	0	1
Nebraska	0	1	57	49	33	2	1	0
Kansas	2	0	70	39	17	11	2	2
South Atlantic States:								
Delaware	0	0	7	8	0	0	0	1
Maryland	0	0	108	58	0	0	7	7
District of Columbia	0	0	90	14	0	0	0	1
Virginia	0	0	26	29	0	0	11	5
West Virginia	0	1	57	78	0	0	3	20
North Carolina	0	0	14	23	2	2	7	1
South Carolina	0	1	6	8	0	0	1	0
Georgia [2]	0	0	5	10	1	0	11	16
Florida	0	0	3	3	0	2	8	7

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 20, 1935, and Apr. 21, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 20, 1935	Week ended Apr. 21, 1934	Week ended Apr. 20, 1935	Week ended Apr. 21, 1934	Week ended Apr. 20, 1935	Week ended Apr. 21, 1934	Week ended Apr. 20, 1935	Week ended Apr. 21, 1934
East South Central States:								
Kentucky	0	0	28	43	0	0	8	0
Tennessee	0	1	25	26	0	1	5	2
Alabama	0	0	8	9	0	0	1	3
Mississippi [3]	0	0	5	8	0	1	1	1
West South Central States:								
Arkansas	0	0	4	3	1	1	1	1
Louisiana [2]	0	0	4	24	0	9	18	20
Oklahoma [4]	0	1	11	9	1	8	6	4
Texas [2]	0	0	50	81	11	36	6	14
Mountain States:								
Montana	0	1	5	8	5	0	0	0
Idaho [5]	0	0	4	--------	1	9	0	0
Wyoming [5]	0	0	21	8	15	0	0	1
Colorado	0	0	215	31	0	0	0	2
New Mexico	1	0	14	22	1	0	5	4
Arizona	0	0	55	15	0	0	1	2
Utah [3]	0	0	135	11	0	6	0	0
Pacific States:								
Washington	0	0	48	31	15	3	1	4
Oregon [5]	0	0	58	50	2	9	1	1
California	2	10	205	213	3	2	6	6
Total	8	22	7,193	5,974	150	182	163	181
First 16 weeks of year	386	328	115,048	97,044	3,068	2,383	2,103	2,400

[1] New York City only.
[2] Typhus fever, week ended Apr. 20, 1935, 6 cases, as follows: Georgia, 1; Louisiana, 1; Texas, 4.
[3] Week ended earlier than Saturday.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Rocky Mountain spotted fever, week ended Apr. 20, 1935, 5 cases, as follows: Idaho, 2; Wyoming, 2; Oregon, 1.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January 1935										
Colorado	1	34	17	--------	2,795	--------	1	1,019	10	5
New Hampshire	--------	7	5	--------	--------	--------	0	48	0	0
February 1935										
Colorado	8	43	30	2	3,457	--------	1	1,206	15	4
New Hampshire	--------	--------	--------	--------	--------	--------	0	32	0	0
March 1935										
Illinois	88	250	266	12	13,448	--------	2	5,187	2	28
Maine	1	7	254	--------	1,170	--------	2	79	0	8
Maryland	15	73	203	1	389	2	1	458	0	9
Michigan	8	56	27	--------	16,266	--------	1	1,929	0	7
Minnesota	9	31	86	--------	7,126	--------	5	916	55	--------
New Jersey	10	89	89	5	5,388	--------	3	786	0	10
Ohio	59	220	278	--------	6,471	--------	3	4,735	0	15
Oregon	7	1	489	--------	478	--------	1	254	5	4
Pennsylvania	18	200	--------	--------	2[illegible],110	1	2	2,757	0	17
South Carolina	23	99	1,775	279	248	84	0	21	0	8
South Dakota	5	24	20	--------	273	--------	1	65	16	0
Tennessee	32	60	851	34	462	6	0	127	0	9
Texas	25	279	5,217	785	855	81	5	429	77	50
West Virginia	12	62	495	--------	2,189	--------	1	388	--------	16
Wyoming	1	5	--------	--------	741	--------	0	95	42	0

January 1935

	Cases
Colorado:	
Chicken pox	519
Impetigo contagiosa	8
Mumps	131
Tetanus	1
Trachoma	1
Vincent's infection	4
Whooping cough	96

February 1935

	Cases
Colorado:	
Chicken pox	182
Impetigo contagiosa	2
Mumps	155
Vincent's infection	12
Whooping cough	81

March 1935

	Cases
Actinomycosis:	
Pennsylvania	1
South Dakota	1
Anthrax:	
Pennsylvania	2
Chicken pox:	
Illinois	2,280
Maine	265
Maryland	818
Michigan	2,103
Minnesota	446
New Jersey	2,152
Ohio	2,774
Oregon	293
Pennsylvania	4,155
South Carolina	93
South Dakota	27
Tennessee	317
Texas	967
West Virginia	204
Wyoming	34
Dengue:	
South Carolina	1
Texas	3
Diarrhea and enteritis:	
Maryland	2
Ohio	12
South Carolina	261
Dysentery:	
Illinois (amoebic)	12
Illinois (amoebic carriers)	32
Illinois (bacillary)	3
Maryland (bacillary)	1
Michigan (amoebic)	2
Minnesota (amoebic)	4
Minnesota (bacillary)	3
Ohio	3
Pennsylvania	1
Tennessee	2
Texas	15
Epidemic encephalitis:	
Illinois	10
Michigan	1
Minnesota	4
New Jersey	4
Ohio	7
Oregon	2
Pennsylvania	7
South Carolina	3
Tennessee	1
Texas	1

March 1935—Continued

	Cases
Food poisoning:	
Ohio	7
German measles:	
Illinois	5,768
Maine	252
Maryland	135
New Jersey	1,576
Ohio	3,775
Pennsylvania	3,429
Tennessee	5
Hookworm disease:	
South Carolina	46
Impetigo contagiosa:	
Illinois	1
Maryland	6
Oregon	31
Tennessee	1
Jaundice, acute infectious:	
Michigan	6
Lead poisoning:	
Illinois	9
New Jersey	1
Ohio	2
Mumps:	
Illinois	699
Maine	53
Maryland	123
Michigan	977
New Jersey	723
Ohio	2,007
Oregon	951
Pennsylvania	4,000
South Carolina	342
South Dakota	238
Tennessee	197
Texas	568
West Virginia	418
Wyoming	10
Ophthalmia neonatorum:	
Illinois	4
Maryland	1
Minnesota	1
New Jersey	1
Ohio	68
Pennsylvania	4
South Carolina	14
Tennessee	2
Paratyphoid fever:	
Illinois	1
Maine	1
Maryland	1
Michigan	1
Oregon	2
Texas	3
Puerperal septicemia:	
Illinois	5
Ohio	9
Rabies in animals:	
Illinois	37
Maryland	6
New Jersey	7
Oregon	2
South Carolina	73
Rocky Mountain spotted fever:	
Oregon	2
Scabies:	
Maryland	2
Oregon	44
Septic sore throat:	
Illinois	19
Maine	1

March 1935—Continued

	Cases
Septic sore throat—Contd.	
Maryland	21
Michigan	88
Ohio	297
Oregon	17
Tennessee	14
Wyoming	9
Tetanus:	
Illinois	2
New Jersey	2
Ohio	1
Trachoma:	
Illinois	765
Michigan	5
Ohio	1
South Dakota	5
Tennessee	30
Trichinosis:	
Illinois	3
Maine	9
Maryland	1
New Jersey	2
Ohio	7
Pennsylvania	2
Tularaemia:	
Illinois	5
Maryland	3
Michigan	2
New Jersey	2
South Carolina	1
Tennessee	5
Typhus fever:	
Tennessee	1
Texas	18
Undulant fever:	
Illinois	7
Maine	5
Maryland	1
Michigan	8
Minnesota	12
New Jersey	2
Ohio	5
Oregon	1
Pennsylvania	1
South Carolina	1
Tennessee	1
Texas	2
Vincent's infection:	
Illinois	16
Maine	11
Maryland	15
Michigan	23
Oregon	8
Tennessee	8
Whooping cough:	
Illinois	1,075
Maine	111
Maryland	199
Michigan	1,073
Minnesota	163
New Jersey	1,672
Ohio	755
Oregon	121
Pennsylvania	1,478
South Carolina	152
South Dakota	39
Tennessee	230
Texas	483
West Virginia	207
Wyoming	49

WEEKLY REPORTS FROM CITIES

City reports for week ended Apr. 13, 1935

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	0	6	6	0	0	2	0	20
New Hampshire:											
Concord	0	------	0	0	2	3	0	0	0	3	13
Nashua	0	------	------	0	------	0	0	------	0	0	------
Vermont:											
Barre	------	------	------	------	------	------	------	------	------	------	------
Burlington	0	------	0	69	0	1	0	0	0	0	15
Massachusetts:											
Boston	2	------	0	34	25	54	0	7	1	13	211
Fall River	1	------	0	16	7	3	0	1	0	2	30
Springfield	0	------	0	134	1	11	0	1	0	10	47
Worcester	0	------	0	5	10	22	0	1	0	5	62
Rhode Island:											
Pawtucket	1	------	0	0	0	0	0	0	0	0	14
Providence	0	------	0	111	7	9	0	3	0	16	75
Connecticut:											
Bridgeport	0	1	0	2	4	9	0	1	0	3	32
Hartford	1	------	0	28	10	16	0	1	0	18	60
New Haven	0	------	0	631	4	1	0	0	0	0	16
New York:											
Buffalo	1	------	1	153	13	53	0	7	0	20	110
New York	25	5	3	1,472	153	818	0	93	5	223	1,165
Rochester	0	------	0	245	2	11	0	1	0	30	64
Syracuse	0	------	0	431	5	8	0	1	0	26	60
New Jersey:											
Camden	3	2	0	1	5	5	0	0	0	0	38
Newark	0	6	0	489	11	11	0	7	0	80	116
Trenton	0	------	0	23	5	5	0	5	0	2	40
Pennsylvania:											
Philadelphia	8	11	7	36	51	121	0	23	0	78	499
Pittsburgh	8	8	4	507	25	46	0	11	0	21	182
Reading	1	------	0	62	2	9	0	2	0	1	23
Scranton	0	------	------	56	------	1	0	------	0	0	------
Ohio:											
Cincinnati	4	------	2	3	14	31	0	9	0	0	122
Cleveland	9	53	2	500	15	52	0	14	1	33	194
Columbus	2	------	0	166	6	36	0	3	0	5	60
Toledo	0	2	1	98	5	14	0	4	1	19	75
Indiana:											
Fort Wayne	3	------	1	14	3	2	0	1	0	1	23
Indianapolis	0	------	0	77	20	20	0	8	0	22	115
South Bend	0	------	0	3	3	8	0	0	0	0	20
Terre Haute	1	------	0	0	0	1	0	0	0	0	23
Illinois:											
Chicago	19	5	3	1,568	57	675	0	36	2	61	724
Springfield	0	------	1	22	2	19	0	1	0	12	27
Michigan:											
Detroit	1	2	2	2,832	21	115	0	15	1	123	267
Flint	0	------	1	51	4	8	0	1	0	2	27
Grand Rapids	0	------	1	140	4	10	0	0	0	31	43
Wisconsin:											
Kenosha	0	------	0	73	1	31	0	0	0	5	6
Milwaukee	0	1	1	141	7	139	0	5	0	12	107
Racine	0	------	0	71	1	14	0	0	0	7	9
Superior	0	------	0	80	1	1	0	0	0	0	7
Minnesota:											
Duluth	0	------	0	437	6	0	0	0	0	1	26
Minneapolis	3	------	0	489	10	166	0	1	0	27	97
St. Paul	3	1	1	13	7	43	0	0	0	13	66
Iowa:											
Davenport	0	------	------	1	------	1	0	------	0	0	------
Des Moines	2	------	------	306	------	5	0	------	0	0	34
Sioux City	2	------	------	3	------	1	0	------	0	1	------
Waterloo	3	2	------	2	------	2	0	------	0	0	------
Missouri:											
Kansas City	8	------	1	130	10	7	0	5	0	2	103
St. Joseph	0	------	0	5	1	0	0	1	2	2	8
St. Louis	12	------	2	24	15	12	0	13	1	3	205

City reports for week ended Apr. 13, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
North Dakota:											
Fargo	1		1	7	0	10	0	0	0	0	9
Grand Forks	0			1		4	0		0	2	
South Dakota:											
Aberdeen	0			23		0	0		0	0	
Nebraska:											
Omaha	2		1	74	9	10	1	0	0	0	57
Kansas:											
Topeka											
Wichita	0		0	490	2	5	0	0	0	1	32
Delaware:											
Wilmington	0		0	4	6	9	0	0	0	1	22
Maryland:											
Baltimore	1	4	2	32	26	51	0	14	1	22	201
Cumberland	0		0	3	0	1	0	0	0	0	9
Frederick	0		0	0	0	0	0	0	0	0	4
District of Col.:											
Washington	16	2	1	50	18	74	0	21	0	4	165
Virginia:											
Lynchburg	0		0	17	1	1	0	1	0	30	16
Norfolk	0	1	1	41	5	2	0	0	0	5	44
Richmond	0		2	129	4	0	0	1	0	0	57
Roanoke	1		0	15	1	0	0	0	0	0	19
West Virginia:											
Charleston	0		0	8	3	2	0	2	0	0	23
Huntington	1			3		3	0		0	0	
Wheeling	0		1	60	4	4	0	0	0	3	16
North Carolina:											
Raleigh	0		0	0	2	0	0	1	0	0	5
Wilmington	0		0	0	2	1	0	0	0	6	11
Winston-Salem	0		0	3	2	2	0	0	0	4	11
South Carolina:											
Charleston	0	10		3	2	0	0	2	0	0	22
Columbia	0		0	0	1	0	0	0	0	0	19
Greenville	0		0	1	1	3	0	0	0	0	16
Georgia:											
Atlanta	4	23	0	0	8	2	0	4	0	0	62
Brunswick	0		0	0	0	0	0	0	0	0	5
Savannah	0	2	2	0	4	1	0	1	1	1	26
Florida:											
Miami	1	2	0	4	1	0	0	1	0	4	23
Tampa	1		0	68	1	2	0	1	0	3	27
Kentucky:											
Ashland	0		0	15	1	0	0	0	0	0	
Lexington	1		0	20	1	0	0	0	0	4	19
Louisville	1	4	0	412	11	19	0	2	0	47	66
Tennessee:											
Memphis	0		0	1	7	4	0	3	1	5	69
Nashville	0		1	1	6	14	0	1	0	2	60
Alabama:											
Birmingham	3	6		20	6	1	0	4	0	9	57
Mobile	0		1	1	2	1	0	3	0	0	20
Montgomery	1			27		0	0		0	4	
Arkansas:											
Fort Smith	0			0		0	0		0	1	
Little Rock	1		0	26	6	0	0	0	0	1	7
Louisiana:											
New Orleans	17	2	2	49	8	7	0	9	7	1	131
Shreveport	1		0	3	7	0	0	5	0	0	51
Texas:											
Dallas	5	2	1		4	4	0	1	0	1	42
Fort Worth	0		0		3	0	0	3	2	0	35
Galveston	1		0	0	3	1	0	0	0	0	11
Houston	4		0	4	4	0	1	4	0	0	64
San Antonio	0		2	0	4	1	0	9	0	1	66
Montana:											
Billings	0		0	14	0	0	0	0	0	0	7
Great Falls											
Helena	0		0	18	0	0	0	0	0	1	5
Missoula	0		0	150	0	1	0	0	0	0	5
Idaho:											
Boise	0		0	1	1	3	0	0	0	0	8
Colorado:											
Denver	4	43	0	147	4	136	2	6		6	93
Pueblo	0		0	116	0	3	0	1	0	15	6

City reports for week ended Apr. 13, 1935—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
New Mexico:											
Albuquerque	1	------	0	1	1	0	0	2	0	1	10
Utah:											
Salt Lake City	0	------	1	7	5	81	0	1	0	115	33
Nevada:											
Reno	0	------	0	2	0	0	0	0	0	0	4
Washington:											
Seattle	0	------	0	130	1	13	3	3	0	7	81
Spokane	0	------	0	173	1	7	0	1	0	0	45
Tacoma	0	------	0	3	3	4	3	0	0	5	30
Oregon:											
Portland	0	1	0	121	6	9	0	0	0	0	75
Salem	0	------	------	0	------	1	0	------	0	0	------
California:											
Los Angeles	7	32	2	65	14	55	1	26	0	11	337
Sacramento	0	----	0	113	1	9	0	2	0	0	19
San Francisco	2	1	0	24	11	18	0	11	1	16	196

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Rhode Island:			
Providence	0	1	0
Connecticut:			
Hartford	0	0	1
New York:			
New York	6	9	1
Rochester	2	0	0
New Jersey:			
Newark	0	1	0
Pennsylvania:			
Pittsburgh	1	2	0
Ohio:			
Cincinnati	8	3	0
Cleveland	2	0	0
Toledo	2	2	0
Indiana:			
Indianapolis	1	0	0
Illinois:			
Chicago	10	4	0
Springfield	2	1	0
Michigan:			
Detroit	3	1	0
Wisconsin:			
Milwaukee	0	1	0
Minnesota:			
Minneapolis	1	0	0
Iowa:			
Davenport	1	1	0
Sioux City	1	0	0
Missouri:			
St. Joseph	2	0	0
Nebraska:			
Omaha	0	1	0
Maryland:			
Baltimore	4	0	1
District of Columbia:			
Washington	4	1	0
Virginia:			
Norfolk	1	1	0
Kentucky:			
Louisville	2	0	0
Tennessee:			
Nashville	1	0	0
Alabama:			
Birmingham	1	0	0
Louisiana:			
New Orleans	1	0	1
Washington:			
Seattle	1	2	0
Spokane	0	0	1
Oregon:			
Portland	4	2	0
California:			
Los Angeles	4	2	0
Sacramento	1	0	0
San Francisco	0	0	1

Epidemic encephalitis.—Cases: New York, 16; Cleveland, 2; Toledo, 1; St. Paul, 1.
Pellagra.—Cases: Winston-Salem, 2; Charleston, S. C., 3; Atlanta, 1; Tampa, 1.
Typhus fever.—Cases: New York, 1; Atlanta, 1.

FOREIGN AND INSULAR

CEYLON

Malaria.—A report dated March 1, 1935, states that the peak of the malaria epidemic was thought to have been passed in Ceylon. A severe drought in many parts of the island was causing additional anxiety. The following mortality figures were given, showing the great increase in deaths (all causes) which occurred during the epidemic.

	Number of deaths		*Number of deaths*
November 1933	9,117	November 1934	12,200
December 1933	9,049	December 1934	19,738
January 1934	11,541	January 1935	36,255

CUBA

Provinces—Notifiable diseases—4 weeks ended April 6, 1935.—During the 4 weeks ended April 6, 1935, cases of certain notifiable diseases were reported in the Provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	1	2		4			7
Chicken pox		5		1	4	1	11
Diphtheria			4	1		1	6
Hookworm disease				7			7
Leprosy				2		21	23
Malaria	188		42	778	137	460	1,605
Measles		13	7	31		2	56
Poliomyelitis	1			2			3
Tuberculosis	4	5	21	70	12	51	166
Typhoid fever		1	8	21	20	6	56

CZECHOSLOVAKIA

Communicable diseases—February 1935.—During the month of February 1935, certain communicable diseases were reported in Czechoslovakia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	6	1	Paratyphoid fever	5	
Cerebrospinal meningitis	25	6	Poliomyelitis	8	2
Chicken pox	275	1	Puerperal fever	42	15
Diphtheria	2,551	195	Scarlet fever	1,630	20
Dysentery	11	4	Trachoma	61	
Influenza	41,747	37	Typhoid fever	309	33
Lethargic encephalitis	2	1	Typhus fever	15	
Malaria	6				

NOTE.—Figures for December 1934 and January 1935 are provisional.

ITALY

Communicable diseases—4 weeks ended December 9, 1934.—During the 4 weeks ended December 9, 1934, certain communicable diseases were reported in Italy, as follows:

Disease	Nov. 12-18		Nov. 19-25		Nov. 26-Dec. 2		Dec. 3-9	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	21	20	22	21	12	12	15	11
Cerebrospinal meningitis	13	13	10	9	12	11	13	12
Chicken pox	263	113	417	130	432	141	345	118
Diphtheria and croup	658	377	872	380	898	440	826	364
Dysentery	11	10	8	6	9	8	10	7
Lethargic encephalitis	6	6	3	3	1	1	1	1
Measles	1,382	256	1,808	252	1,857	200	2,000	202
Poliomyelitis	13	10	14	13	16	14	7	7
Scarlet fever	511	221	550	203	515	185	476	190
Typhoid fever	604	359	655	351	559	321	563	319

YUGOSLAVIA

Communicable diseases—March 1935.—During the month of March 1935, certain communicable diseases were reported in Yugoslavia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	29	2	Paratyphoid fever	5	
Cerebrospinal meningitis	17	6	Scarlet fever	192	2
Diphtheria and croup	559	60	Sepsis	13	7
Dysentery	16	1	Tetanus	16	10
Erysipelas	155	7	Typhoid fever	159	20
Influenza	70,620	109	Typhus fever	117	7
Measles	1,787	34			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Apr. 26, 1935, pp. 580-591. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued May 31, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Plague

British East Africa—Kenya.—During the week ended March 16, 1935, 1 case of plague was reported at Kenya, British East Africa.

Indo-China—Island of Nao-Tchao.—During the period March 1–10, 1935, 20 cases of plague with 15 deaths were reported in the Island of Nao-Tchao, Indo-China.

Yellow Fever

Sierra Leone—Freetown.—On March 10, 1935, 1 case of yellow fever was reported at Freetown, Sierra Leone.

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UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS reprints or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

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PUBLIC HEALTH REPORTS

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CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES[1]

March 24–April 20, 1935

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease."

Meningococcus meningitis.—For the country as a whole, the number of reported cases of meningococcus meningitis (659) was slightly higher than that for the preceding 4 weeks. The increase, however, was confined largely to the Middle Atlantic and East North Central regions. All other sections reported more cases for the preceding period and, with the exception of a few States, a rather steady decline was in progress during the current 4 weeks. In New York the number of cases rose from 61 for the preceding period to 83 for the 4 weeks ended April 20; in Ohio from 48 to 60; in Virginia from 14 to 29; in California from 23 to 35. In South Carolina the number of cases dropped from 23 for the 4 weeks ended March 23 to 2 for the current period; in Tennessee from 28 to 16; and in New Mexico from 11 to 4.

Later reports for the week ended April 27 give a total of 174 cases, which represents an increase of about 15 percent over the preceding week, due largely to increases in Ohio and Kentucky.

The current incidence of this disease was almost 3 times that of last year and was higher than in the corresponding period of any year since 1930, when 1,118 cases were reported. The number of cases (108) reported from the South Atlantic States was the highest for this period in the 7 years for which data are available; in the South Central and Western sections the incidence was the highest since 1930; and in the North Atlantic and North Central regions the figures were the highest since 1931.

[1] From the Office of Statistical Investigations, U. S. Public Health Service. The numbers of States included for the various diseases are as follows: Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 47; diphtheria, 48; scarlet fever, 48; influenza, 44 States and New York City. The District of Columbia is counted as a State in these reports. These summaries include only the 8 important communicable diseases for which the Public Health Service receives regular weekly reports from the State health officers.

The table shows by geographic areas the number of cases reported during 1934–35 in comparison with corresponding periods in the 3 preceding years.

Meningococcus meningitis cases reported in each geographic area during 1934–35, with comparative data for corresponding periods in the 3 preceding years [1]

Year	4-week period ended												Week ended				
	May 19	June 16	July 14	Aug. 11	Sept. 8	Oct. 6	Nov. 3	Dec. 1	Dec. 29	Jan. 26	Feb. 23	Mar. 23	Mar. 30	Apr. 6	Apr. 13	Apr. 20	Apr. 27
Total [2]																	
1934–35	220	178	134	130	129	135	135	120	202	307	525	646	173	174	158	154	174
1933–34	230	202	145	147	129	130	125	157	172	210	227	225	61	63	58	64	52
1932–33	277	216	141	157	160	179	146	221	241	362	307	393	89	95	75	81	63
1931–32	513	333	244	260	258	211	225	279	280	314	327	296	112	69	94	71	60
N. E. and M. Atl.:																	
1934–35	41	42	26	39	28	29	23	33	44	42	52	111	32	35	22	38	39
1933–34	30	44	34	48	45	27	25	39	38	38	40	42	8	11	9	8	12
1932–33	74	71	38	42	43	56	47	56	43	58	58	63	15	17	24	16	8
1931–32	116	88	85	86	84	84	68	69	71	91	83	70	34	20	24	25	18
E. N. C.:																	
1934–35	59	54	42	36	39	44	37	27	44	79	120	140	49	50	46	44	56
1933–34	89	79	51	30	28	29	32	41	45	60	58	58	27	21	11	24	10
1932–33	75	57	43	52	48	43	35	75	81	115	86	137	32	33	17	30	29
1931–32	170	112	73	62	58	66	55	62	85	105	89	96	41	13	33	21	15
W. N. C.:																	
1934–35	34	28	12	14	21	18	15	15	27	33	81	90	22	22	16	15	17
1933–34	34	25	13	16	12	9	6	17	18	16	31	26	12	8	11	4	12
1932–33	25	23	11	18	19	19	16	15	30	53	39	63	10	12	6	12	19
1931–32	48	36	21	21	24	28	27	21	25	23	39	27	10	5	8	3	6
S. Atl.:																	
1934–35	21	13	16	10	12	17	10	22	25	54	93	121	30	32	25	21	21
1933–34	17	16	15	16	15	23	22	27	33	25	24	29	10	6	11	14	2
1932–33	32	20	12	17	14	12	13	15	26	41	43	26	8	6	9	7	0
1931–32	60	41	22	22	22	16	16	35	24	32	29	34	10	18	8	6	8
E. and W. S. C.:																	
1934–35	51	23	15	19	18	20	29	18	35	67	124	114	28	15	33	25	24
1933–34	35	21	20	25	14	27	22	20	19	48	47	51	4	11	12	8	10
1932–33	35	24	20	17	24	25	21	23	34	68	56	60	14	17	16	9	7
1931–32	75	40	27	42	32	23	32	46	41	33	53	30	9	8	13	13	12
M. and Pac.: [2]																	
1934–35	14	13	23	12	11	8	18	14	27	32	55	61	12	20	16	11	17
1933–34	16	17	12	12	15	12	18	13	19	23	27	19	3	6	4	6	6
1932–33	36	18	17	11	12	19	16	37	27	27	25	44	10	7	3	7	5
1931–32	44	21	16	27	34	27	27	46	34	30	34	39	9	5	3	6	10

[1] See Public Health Reports for Apr. 12, 1935, p. 504, for a similar table by weeks from Dec. 2, 1934, to Mar. 30, 1935.
[2] Exclusive of Nevada.

Measles.—The number of cases of measles rose from approximately 132,000 for the preceding 4 weeks to about 142,000 for the 4 weeks ended April 20. The disease was still quite prevalent in the New England and Middle Atlantic, East North Central, and Pacific regions; a definite decline appeared in the West North Central, South Atlantic, and East South Central sections; and the West South Central and Mountain regions reported approximately the same incidence as for the preceding period.

Compared with recent years the current incidence was about 10 percent in excess of that for the corresponding period last year, when the number of cases exceeded by approximately 30,000 the peak incidence of 1926, a year in which measles was unusually prevalent. For this period in the years 1933 and 1932, 72,322 and 61,868 cases, respectively, were reported. In each of the North Central sections

the number of cases was more than twice that for last year, and other areas reported about 25 percent increases. In the South Atlantic and South Central regions, where the disease was unusually prevalent last year, the numbers of cases were about 20 and 40 percent, respectively, of last year's figures.

Scarlet fever. For the country as a whole, the current wave of scarlet fever apparently reached its peak during the week ended March 30, with a total of 8,195 cases, and declined rapidly during the following 3 weeks. However, for the 4 weeks ended April 20, more cases (31,108) were reported than in the corresponding period of any of the 7 years for which data are available. Each geographic region except the East and West South Central reported an excess over the corresponding period last year, the increases ranging from 10 percent in the New England to more than 5 times last year's figure in the Mountain region. States in which the disease has been most prevalent are Illinois (5,205 cases), Wisconsin (1,832), Minnesota (1,131), Colorado (967), Utah (430), and the District of Columbia (395). The South Central regions reported the lowest incidence in recent years.

Influenza.—The number of cases of influenza dropped more than 50 percent from the preceding 4-week period. For the 4 weeks ended April 20 there were 6,922 cases reported, representing about a 5-percent decrease from last year's figure for the corresponding period and an increase of about 30 percent over 1933. In most of the geographic areas the reports approximated the expected number for this season of the year.

Typhoid fever.—The number of cases of typhoid fever reported for the 4 weeks ended April 20 was 568. For this period in the years 1934, 1933, and 1932 the numbers of cases totaled 624, 604, and 664, respectively. The East North Central and South Central areas reported slight increases over last year's figures, but in all other sections the current incidence was considerably below that of last year. Illinois, with 37 cases, and Louisiana and Texas, with 70 and 38 cases, respectively, seemed mostly responsible for the increases in those sections.

Diphtheria.—The steady decline of diphtheria continued. For the country as a whole, 2,193 cases were reported for the current 4-week period, or about 85 percent of last year's figure for the corresponding period. All regions were low in relation to last year except the East North Central and Mountain. In the former section the increase was approximately 30 percent over last year, while in the latter area it was less than 10 percent.

Poliomyelitis.—The incidence of poliomyelitis continued to decline. For the 4 weeks ended April 20 there were 77 cases, as compared with 91 for the corresponding period last year and 54 in 1933. The disease

was considerably less prevalent in the East North Central region and also in the Mountain and Pacific areas than it was last year, but in all other sections it remained at about the 1934 level. At this time last year the number of cases reported from the Mountain and Pacific regions was somewhat higher than the normal expectancy, and marked, as it later developed, the beginning of an epidemic in California and adjacent States.

Smallpox.—Of a total of 739 cases of smallpox reported for the 4 weeks ended April 20, Texas had 139, Nebraska 123, Wisconsin 111, Kansas 61, Washington 60, Wyoming 35, Iowa and Colorado 27 each. The remaining cases (146) were widely distributed over the various geographic areas, no State reporting more than a normal incidence. The current incidence was about 10 percent in excess of that for the corresponding period last year and 10 percent below that of 1933. Only 1 section, the West North Central, which contains 2 of the States mentioned above, showed any significant increase over last year. No cases were reported from the New England and Middle Atlantic States, and the East North Central, South Central, and South Atlantic regions reported the lowest incidence in recent years.

Mortality, all causes.—The average mortality rate from all causes in large cities, as reported by the Bureau of the Census, for the 4 weeks ended April 20 was 12.0 per 1,000 inhabitants (annual basis). For the corresponding periods in 1934, 1933, 1932, and 1931 the rates were 12.4, 11.3, 12.5, and 12.9, respectively.

CITY HEALTH OFFICERS, 1934

Directory of Those in Cities of 10,000 or More Population

Directories of the city health officers in the cities of the United States having a population of 10,000 or more have been published in the Public Health Reports [1] for each year from 1916 to 1933, except 1932, for the information of health officers and others interested in public-health activities. These directories have been compiled from data furnished by the health officers. The cities included in this directory are those having populations of 10,000 or more according to the 1930 census.

The asterisk (*) indicates that the officer before whose name it appears has been reported to be a "whole-time" health officer. For this purpose a "whole-time" officer is defined as "one who does not engage in the practice of medicine or in any other business, but devotes all of his time to official duties."

[1] Reprints nos 346, 416, 494, 539, 599, 702, 767, 876, 930, 1025, 1103, 1177, 1257, 1333, 1423, 1521, and 1613 from the Public Health Reports.

City	Name of health officer	Official title
Alabama:		
Anniston		
Bessemer	*Robert V. Hazlewood, D. V. M	Director of sanitation.
Birmingham	*J. D. Dowling, M. D	County health officer.
Decatur	*L. R. Murphree, M. D., C. P. H	Do.
Dothan	*F. G. Granger, M. D	Do.
Fairfield	*J. D. Dowling, M. D	Do.
Florence	*W. D. Hubbard, M. D	County and city health officer.
Gadsden	*C. L. Murphree, M. D.	County health officer.
Huntsville	*W. C. Hatchett, M. D	Do
Mobile	*O. L. Chason, M. D., D. P. H.	Do.
Montgomery	*J. L. Bowman, M. D.	Do.
Phenix		
Selma	*L. T. Lee, M. D.	Do.
Tuscaloosa	*A. A. Kirk, M. D.	County and city health officer.
Arizona:		
Phoenix	B. M. Berger, M. D	City health officer.
Tucson	*Lewis H. Howard, M. D	Health officer.
Arkansas:		
Blytheville	Isaac R. Johnson, M. D	City health officer.
El Dorado	Fergus O. Mahony, M. D	Do.
Fort Smith	*J. E. Johnson, M. D.	District health officer.
Hot Springs	*James F. Merritt, M. D	County and city health officer.
Jonesboro	R. C. Shanlever, M. D.	City health officer.
Little Rock	V. T. Webb, M. D.	Do.
North Little Rock	V. L. Eason, M. D., D. P. H.	Health officer and city physician.
Pine Bluff	*Walter Hugh Bruce, M. D.	Director.
Texarkana	Harry E. Murry, M. D	City health officer.
California:		
Alameda	Francis B. Galbraith, M. D.	Health officer and city physician.
Alhambra [1]	*Samuel J. Stewart, M. D	District health officer.
Anaheim		
Bakersfield	Peter J. Cuneo, M. D	City health officer.
Berkeley	*Frank L. Kelly, M. D., D. P. H.	Health officer.
Beverly Hills	Charles F. Nelson, M. D.	Do.
Brawley	John L. Parker, M. D.	City health officer.
Burbank [1]	Thomas H. Ransom, M. D	Executive and consulting physician.
Burlingame	M. F. Desmond, M. D	City health officer.
Compton [1]		
Eureka	William J. Quinn, M. D	Health officer.
Fresno	C. Mathewson, M. D.	City health officer.
Fullerton	*K. H. Sutherland, M. D	County health officer.
Glendale [1]	F. A. Wilmot, M. D., D. P. H.	District health officer.
Huntington Park [1]	*George M. Malkin, M. D	Do.
Inglewood [1]	*J. W. Robinson, M. D.	Deputy health officer.
Long Beach	*S. G. Arnold, M. D	Health officer.
Los Angeles	*George Parrish, M. D	Do.
	*George M. Stevens, M. D	Epidemiologist and first assistant health officer.
	*G. F. Schmnelzel, M. D	Chief deputy health officer.
	*A. L. Peterson	Executive assistant.
	Divisional directors:	
	*Charles F. Kiley	Chief accountant.
	*J. L. Lanigan	Secretary to health board.
	*Harry Cohn, M. D.	Director of tuberculosis.
	*Agnes M. Talcott	Director of nurses.
	*F. W. Peterson	Director of vital statistics.
	*John Carman	Chief chemist.
	*Mona Bettin, M. D	Chief bacteriologist.
	*Morris S. Siegel	Director of housing and sanitation.
	*G. L. Clark, D. V. M	Director of milk and meat inspection.
	*H. Manning Elliott, M. D.	Director of venereal clinic (male).
	*Emily F. Balcom, M. D	Director of venereal clinic (female).
	*Lyle McNeile, M. D	Director, maternity division.
	*C. K. Stewart	Director of rodent division.
	*J. M. Cain	Director of quarantine and morbidity division.
	*L. V. Dieter, D. Phar	Director of laboratories.
	*Lillian Kositza, M. D	Director, child hygiene division.
Modesto	*Elwyn F. Reamer, M. D	County health officer.
Monrovia [1]	*J. M. Furtsman, M. D	District health officer.
Oakland	*N. N. Ashley, M. D	Health officer.
Ontario	Calvert L. Emmons, M. D	Do.
Palo Alto	*Louis Olsen, S. E	Do.
Pasadena	*Wilton L. Halverson, M. D., Dr. P. H.	Do.
Pomona [1]	*M. U. Stoneman, M. D	District health officer.
Redlands	F. H. Folkins, M. D	City health physician.
Richmond	Charles R. Blake, M. D	Commissioner of health.
Riverside	Wendell A. Jones, M. D	Do.

[1] Under supervision of Dr. J. L. Pomeroy, health officer of Los Angeles County, Hall of Justice, Los Angeles, Calif.

City	Name of health officer	Official title
California—Continued.		
Sacramento	*Herbert F. True, M. D.	City health officer.
Salinas	*Marie K. Fidel, P. H. N.	Do.
San Bernardino	Walter D. Lonker, M. D.	Do.
San Diego	*Alex M. Lesem, M. D.	Director of health.
San Francisco:		
Department of public health—	Health advisory board:	
	Lawrence Arnstein, Chairman.	
	Howard Adler, M. D.	
	Frank J. Klimm	
	T. J. Lenehan	
	F. H. McKevitt, D. D. S.	
	J. W. Ward, M. D.	
	W. W. Wymore, M. D.	
	*J. C. Geiger, M. D.	Director of public health.
	*Jacques P. Gray, M. D.	Assistant director of public health.
	*C. M. Wollenberg	Director of institutions—Superintendent, Laguna Honda Home.
	*L. M. Wilbor, M. D.	Superintendent, San Francisco Hospital.
	*Myra W. Kimball, R. N.	Superintendent, Hassler Health Home.
	Edmund Butler, M. D.	Chief surgeon, Emergency Hospital Service.
	George K. Rhodes, M. D.	Assistant chief surgeon, Emergency Hospital Service.
	*James I. O'Dea	Chief steward, Emergency Hospital Service.
	*P. R. Hennessy	Senior accountant.
	George H. Becker, M. D.	Director, bureau of communicable disease.
	R. W. Burlingame, M. D.	Resident physician, isolation division, San Francisco Hospital, and director division of venereal disease control.
	W. R. P. Clark, M. D.	Director, division of tuberculosis control.
	*Paul S. Barrett, M. D.	Director, bureau of child hygiene.
	*Ernestine Schwab, P. H. N.	Director of field nursing.
	R. Grosso, D. D. S.	Chief dental surgeon.
	Olga Bridgman, M. D.	Chief, division of mental hygiene.
	*T. P. Lydon	Director, bureau of food and milk.
	*J. J. Burke	Chief, food inspection.
	*B. Q. Engle	Chief, pasteurizing plant inspection.
	*C. G. Hansen	Chief, meat and market inspection.
	*G. A. Melody, D. V. M.	Chief, dairy inspection.
	C. G. Hyde, C. E.	Consultant in public health engineering.
	*A. B. Crowley	Chief, industrial hygiene division.
	*H. P. Thyle	Chief, housing inspection division.
	*W. D. Hobro	Chief, plumbing inspection division.
	*Annie D. MacRae, M. D.	Director of laboratories.
	*Clinton Davis	Chief chemist.
San Jose	*Henry C. Brown, M. D.	Health officer.
San Leandro	*I. O. Church, M. D.	County health officer.
San Mateo	James A. Warberton, M. D.	City health officer.
Santa Ana	*K. H. Sutherland, M. D.	Do.
Santa Barbara	*Roscoe C. Main, M. D.	Health officer.
Santa Cruz	John T. Harrington, M. D.	City health officer.
Santa Monica [1]	*F. G. Crandall, M. D.	District health officer.
Santa Rosa	*E. J. Helgren, B. S. B.	Health officer.
South Gate [1]	*J. L. Pomeroy, M. D.	County health officer.
South Pasadena	E. J. Johnston, M. D.	Health officer.
Stockton	*John J. Sippy, M. D.	District health officer.
Vallejo	Edward A. Peterson, M. D.	City health officer.
Ventura	John A. DeSerpa, D. V. M.	Health officer.
Whittier [1]	*Reuben Louis Kaufman, M. D., C. P. H.	District health officer.
Colorado:		
Boulder	*H. L. Morency, Ph. B., D. V. M.	Director of public health and sanitation.
Colorado Springs	Omer Rand Gillett, M. D.	Health officer.
Denver	B. B. Jaffa, M. D.	Do.
Fort Collins	T. C. Taylor, M. D.	Do.
Grand Junction	E. H. Munro, M. D.	City physician.
Greeley	W. A. Schoen, M. D.	Do.
Pueblo	*W. E. Buck, M. D.	Chief, department of health.
Trinidad	B. M. Cowley, M. D.	City physician.
Connecticut:		
Ansonia	William H. O'Neil, M. D.	Health officer.
Bridgeport	*Richard O'Brien Shea, M. D.	Do.
Bristol	B. B. Robbins, M. D.	City health officer.
Danbury	James F. Young, M. D.	Do.
Derby	Thomas F. Plunkett, M. D.	Health officer.

[1] Under supervision of Dr. J. L. Pomeroy, health officer of Los Angeles County, Hall of Justice, Los Angeles, Calif.

City	Name of health officer	Official title
Connecticut—Continued.		
East Hartford	Francis W. Becker, M. D.	Health officer.
Enfield	Frank F. Simonton, M. D.	Do.
Fairfield	*Lawrence Earl Poole, M. D., Dr. P. H.	Health officer and school physician.
Groton	Frank Wm. Hewes, M. D.	Health officer.
Hamden		
Hartford	*Charles Porter Botsford, M. D.	Superintendent of health.
Manchester	D. C. Y. Moore, M. D.	Chairman, board of health.
Meriden	Joseph A. Cooke, M. D.	Health officer.
Middletown	John H. Mountain, M. D., D. D. S.	Do.
Milford		
Naugatuck		
New Britain	*Louis J. Dumont, M. D.	Superintendent of health.
New Haven	*Leonard Greenburg, C. E., Ph. D., M. D.	Health officer.
New London	*Benjamin N. Pennell, D. V. S.	Health officer.
Norwalk	Robert E. Perdue, M. D.	Do.
Norwich	Harrison Gray, M. D.	Do.
Shelton	Francis I. Nettleton, Ph. B., M. D.	Commissioner of health.
Stamford	*Raymond D. Fear, M. D., D. P. H.	Health commissioner.
Stonington		
Stratford	DeRuyter Howland, M. D.	Town health officer.
Torrington	Elias Pratt, M. D.	Health officer.
Wallingford		
Waterbury	Edward J. Godfrey, M. D.	Do.
West Hartford	*Harry B. Smith, M. D.	Superintendent of health.
Willimantic	Nathan Spector, M. D.	City health officer.
Delaware:		
Wilmington	James W. Butler, M. D.	Secretary, board of health.
District of Columbia:		
Washington	*George C. Ruhland, M. D.	Health officer.
	*Arthur G. Cole	Chief clerk and deputy health officer.
Bureau of preventable diseases.	*James G. Cumming, M. D.	Director.
Medical inspection of schools.	*Joseph A. Murphy, M. D.	Do.
Food inspection	*Reid R. Ashworth, D. V. S.	Do.
Sanitary inspection	*J. Frank Butts, LL. B.	Do.
Vital statistics	*John H. Milligan	Do.
Chemical laboratory	*John B. Reed	Do.
Bacteriological laboratory	*John E. Noble	Do.
Serological laboratory	*Jesse P. Porch, D. V. M.	Do.
Child welfare and hygiene service.	*Hugh J. Davis, M. D.	Do.
Pound	*Walter R. Smith	Poundmaster.
Florida:		
Daytona Beach	*Simon Reed	Health officer.
Gainesville	W. Lassiter, M. D.	City health officer.
Jacksonville	*N. A. Upchurch, M. D.	Health officer.
Key West	H. C. Galey, M. D.	City health officer.
Lakeland	J. D. Griffin, M. D.	City physician and health officer.
Miami	*George N. McDonell, M. D.	Director of public health.
Orlando	C. D. Christ, M. D.	City health officer.
Pensacola		
St. Augustine	Herbert E. White, M. D.	City and county health officer.
St. Petersburg	Claude B. Wright, M. D.	City physician.
Sanford	Julian N. Tolar, M. D.	City health officer.
Tallahassee	*L. J. Graves, M. D.	Do.
Tampa	*J. R. McEachern, M. D.	Do.
West Palm Beach	W. E. Van Landingham, M. D.	Do.
Georgia:		
Albany	*Hugo Robinson, Ph. G., M. D.	Commissioner of health, city and county.
Athens	*Wedford W. Brown, M. D.	Do.
Atlanta	*John P. Kennedy, M. D.	City health officer.
Augusta	*Henry Grady Callison, M. D.	Commissioner of health.
Brunswick	*M. E. Winchester, M. D., Dr. P. H.	Do.
Columbus	W. E. Mayher, M. D.	Health officer and city physician.
Decatur	H. Homer Allen, M. D.	City physician.
Griffin	*W. C. Humphries, M. D.	Commissioner of health.
Lagrange	*S. C. Rutland, M. D.	Health officer.
Macon	*J. D. Applewhite, M. D.	Do.
Rome	*B. V. Elmore, M. D.	Commissioner of health.
Savannah	*Victor H. Bassett, M. D.	Do.
Thomasville	*H. B. Jenkins, M. D., M. S. P. H.	Do.
Valdosta	*Gordon T. Crozier, M. D., Dr. P. H.	Do.
Waycross	*George E. Atwood, M. D., D. P. H.	Do.

City	Name of health officer	Official title
Idaho:		
Boise	*W. H. Rhodes	Health officer.
Pocatello	*W. L. Raymond	Sanitary inspector.
Illinois:		
Alton	William S. McGinnis, M. D.	Health commissioner.
Aurora	George W. Haan, M. D.	Health commissioner and registrar.
Belleville	*Frank T. Kern	Health officer.
Berwyn	*Edward J. Farrell, M. D.	Health director.
Bloomington	B. Markowitz, M. D.	Do.
Blue Island	*L. A. Burkhart	Commissioner of health.
Brookfield	Harriet L. Hockendorf, R. N.	Health commissioner.
Cairo	C. L. Weber, M. D.	Health officer.
Calumet City	E. S. O'Brien, M. D.	Health commissioner.
Canton	J. C. Simmons, M. D.	City physician.
Centralia	H. E. Wilson, M. D.	Health officer.
Champaign	C. George Appelle, M. D.	City health officer.
Chicago	Herman N. Bundesen, M. D.	President, board of health.
	H. O. Jones, M. D.	Director, medical service.
	Louis E. Schmidt, M. D.	Secretary.
	F. O. Tonney, M. D.	Director, technical service and research.
Bureau of communicable diseases.	Isaac D. Rawlings, M. D.	Chief of bureau.
Bureau of child welfare	Henry C. Niblack, M. D.	Do.
Bureau of laboratories and research.	John L. White, M. D.	Do.
Bureau of public health engineering.	Joel I. Connolly	Do.
Bureau of dairy products	Henry C. Becker, M. D. V.	Do.
Bureau of food inspection	J. P. Kilcourse	Do.
Chicago Heights	Ira C. Harman, M. D.	Health commissioner.
Cicero	Frank J. Pokorney, P. H. G., M. D.	Commissioner of health.
Danville	E. B. Cooley, M. D.	Director of health.
Decatur	*W. M. Talbert, M. D.	City physician.
East Moline	J. Henry Fowler, M. D.	Do.
East St. Louis	*A. P. Lauman, Sr.	Commissioner of health and safety.
Elgin	*A. L. Mann, M. D.	City physician and executive officer.
Elmhurst	A. L. Mathis, M. D.	Health commissioner.
Elmwood Park	*Mrs. Laura Arney, C. P. H. N.	President, board of health.
Evanston	*John W. Pollard, B. L., M. D.	Commissioner of health.
Forest Park	William C. Masslow, M. D.	Do.
Freeport	Karl B. Rieger, M. D.	Do.
Galesburg	E. D. Wing, M. D.	Do.
Granite City	*A. M. Jennings	Mayor and chairman of board of health.
Harrisburg	Charles Walden, M. D.	City physician.
Harvey	M. R. Morse, M. D.	Health officer.
Highland Park	Donald E. Rossiter, M. D.	President, board of health.
Jacksonville	T. O. Hardesty, M. D.	County health officer.
Joliet	*Lloyd B. Andrew, M. D.	Health commissioner.
Kankakee	Joseph A. Guertin, M. D.	Do.
Kewanee	H. N. Heflin, M. D.	Do.
La Grange	T. C. McDougal, M. D.	Village health officer.
La Salle	*Arlington Ailes, M. D., C. P. H.	Health commissioner.
Lincoln		
Mattoon	Lovell A. Neal, M. D.	Commissioner of health.
Maywood	John Peters, M. D.	Do.
Melrose Park	*Edmund G. Brust, M. D.	Do.
Moline	Carl A. Peterson, M. D.	City physician.
Mount Vernon	W. G. Parker, M. D.	Do.
Oak Park	Frank S. Needham, M. D.	Commissioner of health.
Ottawa		
Park Ridge	Martin W. Caveney, M. D.	Health commissioner.
Pekin	Nelson A. Wright, Jr., M. D.	Health officer.
Peoria	E. A. Garrett, M. D.	Commissioner of health.
Quincy	*H. O. Collins, M. D.	Public health officer.
Rock Island	H. W. Shuman, M. D.	City physician.
Rockford	*N. C. Bullock, M. D.	Commissioner of health.
Springfield	C. W. Milligan, M. D.	Superintendent of health.
Sterling	Walter I. Carolus, M. D.	City health officer.
Streator		
Urbana	Willard L. Veirs, M. D.	Chairman, board of health.
Waukegan	John D. Foley, M. D.	Health commissioner.
West Frankfort		
Wilmette	Martin H. Seifert, M. D., P. H. G.	Do.
Winnetka	*Howard A. Orvis, M. D., M. S. in P. H.	Health officer.
Indiana:		
Anderson	George B. Metcalf, M. D.	Secretary, city board of health.
Bedford	Charles Blackburn	City health officer.
Bloomington	R. A. De Motte, M. D.	Secretary, city board of health.
Connersville	Herman W. Smelser, M. D.	County health commissioner.

City	Name of health officer	Official title
Indiana—Continued		
Crawfordsville	[illegible] N. Daugherty, M. D.	Secretary board of health
East Chicago	J. A. [illegible], M. D.	Do.
Elkhart	E. J. Mul[illegible], M. D.	Do.
Elwood	Frank A. N[illegible], M. D.	Do.
Evansville	E. I. [illegible], M. D.	Do.
Fort Wayne	Karl C. [illegible], M. D.	Health commissioner
Frankfort	A. C. Ch[illegible], M. D.	Secretary board of health
Gary	Walter M. [illegible], M. D.	Do.
Goshen	O. A. Whipple, M. D.	City health officer
Hammond	H. O. [illegible], M. D.	Health commissioner
Huntington	Dan D. [illegible] Bower, M. D.	County commissioner of health
Indianapolis	H. G. Morgan, M. D.	Health commissioner
Jeffersonville	Samuel E. [illegible], M. D.	Secretary city board of health
Kokomo	W. J. Marshall, M. D.	Do.
La Fayette	M. M. [illegible], M. D.	Do.
La Porte	Jon Nelson Kelly, M. D.	Health officer
Logansport	[illegible] E. Dunn	Do.
Marion	E. H. [illegible], M. D.	Secretary board of health
Michigan City	E. M. [illegible], M. D.	Health officer
Mishawaka	M. D. Wygant, M. D.	Secretary board of health
Muncie	J. H. Williams, M. D.	Do.
New Albany	Anna I. McKamy, Ph. D., M. D.	Do.
Newcastle	Walter M. [illegible]tout, M. D.	Do.
Peru	W. H. Wagoner, M. D.	Do.
Richmond	M. E. Johnston, M. D.	Health commissioner
Shelbyville	Walter C. McFadden, M. D.	Secretary city board of health
South Bend	John B. Berteling, M. D.	Do.
Terre Haute	Amy H. [illegible], M. D.	Do.
Vincennes	Robert G. Moore, M. D.	Do.
Whiting	B. B. Reeve, M. D.	Do.
Iowa		
Ames	B. D. Atchley, M. D.	City health officer
Boone	William V. [illegible], M. D.	Do.
Burlington	Arthur C. Sch[illegible], M. D.	City physician
Cedar Rapids	*James Y[illegible]	City health officer
Clinton	Frank A. Hohenschuh, M. D.	Do.
Council Bluffs	J. M. Moskovitz, M. D.	Do.
Davenport	George Braunlich, Ph. B., M. D.	City physician
Des Moines	Harry L. Ransom, M. D.	Health commissioner
Dubuque	Walter J. Connell, M. D., M. P. H.	Health director
Fort Dodge	J. F. Calvin, M. D.	City physician
Fort Madison	Harold E. Noble, M. D.	Do.
Iowa City	Isom A. Rankin, M. D.	City health officer
Keokuk	Charles A. Dimond, M. D.	Physician to board of health
Marshalltown	[illegible], M. D.	City health officer
Mason City	C. M. Franchere, M. D.	City health director
Muscatine		
Newton	M. R. Hammer, M. D.	City physician
Oskaloosa	Oscar J. Du Bois, D. O.	City health officer
Ottumwa	William Herrick, M. D.	Do.
Sioux City	*W. [illegible] Petty, M. D.	Director Woodbury County health unit
Waterloo	F. F. [illegible], M. D.	City health officer
Kansas		
Arkansas City	P. [illegible], M. D.	Do.
Atchison	William K. [illegible], M. D.	City and county health officer
Chanute	Ralph A. [illegible], M. D.	City health officer
Coffeyville	E. S. Townsend, M. D.	City physician
Dodge City		
Eldorado	*Jack Loman	Sanitary inspector
Emporia	*C. H. Man[illegible], M. D.	County health officer
Fort Scott	C. I. Mo[illegible], M. D.	City health officer
Hutchinson	Guy R. W[illegible], M. D.	City physician
Independence	Enoch C. Wickersham, M. D.	Secretary county board of health
Kansas City	H. W. Kassel, M. D.	Director of health
Lawrence	James M. Mott, M. D.	Superintendent of public health
Leavenworth	A. I. Suwalsky, M. D.	City physician
Manhattan	Daniel L. Evans, M. D.	City health officer
Newton	M. C. Martin, M. D.	County health officer
Parsons	M. C. Ruble, M. D.	City health officer
Pittsburg	C. Martin Montee, M. D.	Do.
Salina	S. I. Bl[illegible], M. D.	County health officer
Topeka	*F. P. Helm, M. D.	City health officer
Wichita	J. I. Wolfe, M. D.	Director of public welfare
Kentucky		
Ashland	*R. D. Higgins, M. D.	Director Boyd County health department
Bowling Green	*G. M. Wells, M. D.	Director, Warren County health department
Covington	Theo Salleo, M. D.	City health officer
Fort Thomas	Frank H. South[illegible], M. D.	Do.
Frankfort	R. M. Coblin, M. D.	Do.
Henderson	*Robert K. Galloway, M. D., M. P. H.	County health officer

City	Name of health officer	Official title
Kentucky—Continued.		
Hopkinsville	Philip E. Haynes, M. D.	City health officer.
Lexington	*Dennis A. Furlong	Acting health officer.
Louisville	Hugh Rodman Leavell, M. D.	Director of public health.
Middlesboro		
Newport	John Todd, M. D.	City health officer.
Owensboro	A. L. Kincheloe, M. D.	Daviess County health officer.
Paducah	R. W. Robertson, M. D.	City health officer.
Louisiana:		
Alexandria	R. B. Wallace, M. D.	President, city board of health.
Baton Rouge	T. J. McHugh, M. D.	City health officer.
Bogalusa	J. H. Slaughter, M. D.	City physician.
Lafayette	Georges Armand Martin, Ph. G., M. D.	Do.
Lake Charles	W. P. Bordelon, M. D.	President, board of health.
Monroe	*Henry Haas	Superintendent, city sanitary department.
New Orleans	*William Henry Robin, M. D.	Superintendent of public health.
Shreveport	*W. J. Sandidge, M. D.	Do.
Maine:		
Auburn	E. Leathers, M. D.	Health officer.
Augusta	George A. Coombs, M. D.	Do.
Bangor	*Harry D. McNeil, M. D.	Do.
Bath	Joseph I. Smith, M. D.	Do.
Biddeford	*John W. Mahoney	Local health officer.
Lewiston	*Robert J. Wiseman, Jr., M. D.	Health officer.
Portland	*Thomas Tetreau, M. D.	City health officer.
Sanford	*William H. Kelly, M. D.	Local health officer.
South Portland	Roderick L. Huntress, M. D.	Health officer.
Waterville	*Arthur R. Daviau, M. D.	Do.
Westbrook	Patrick H. Welch	Local health officer.
Maryland:		
Annapolis	James J. Murphy, M. D.	City health officer.
Baltimore:		
Administration	*Huntington Williams, M. D., Dr. P. H.	Commissioner of health.
	*William H. F. Warthen, M. D.	Assistant commissioner of health.
	*Harry S. Mustard, M. D.	Health officer, eastern health district.
Medical section:		
Bureau of communicable diseases.	*Adolph Weinzirl, M. D.	Epidemiologist.
Sydenham hospital	*Myron G. Tull, M. D.	Superintendent.
Bureau of tuberculosis	Bartus T. Baggott, M. D.	Director.
Bureau of venereal diseases.	*Ferdinand O. Reinhard, M. D.	Do.
Bureau of child welfare	*William K. Skilling, M. D.	Do.
Division of school hygiene.	H. Warren Buckler, M. D.	Chief.
Dental clinics	Morris Cramer, D. D. S.	Supervisor.
Laboratories	*C. Leroy Ewing	Director.
Public health nursing	*Jane B. Laib, R. N.	Do.
Sanitary section	*R. S. Craig	Do.
Bureau of milk control	*John A. Lescure	Do.
Bureau of food control	*Ferdinand A. Korff	Do.
Bureau of meat inspection.	*William Brenner, V. D.	Chief.
Bureau of environmental hygiene.	*Wilmer H. Schulze, Phar. D.	Director.
Cumberland	*Harvey H. Weiss	Health officer and registrar of vital statistics.
Frederick	*Elmer C. Kefauver, M. D.	City health officer.
Hagerstown	*W. Ross Cameron, M. D.	Do.
Salisbury	*S. H. Hurdle, M. D.	Deputy State health officer.
Massachusetts:		
Adams	James F. McLaughlin, M. D.	Chairman, board of health.
Amesbury	Clarence S. Morse	Agent, board of health.
Arlington	*William H. Bradley	Do.
Athol	Marion B. Sitley, M. D.	Secretary, board of health.
Attleboro	William O. Hewitt, M. D.	Health officer.
Belmont	*Thomas F. Harris	Agent, board of health.
Beverly	*Alonzo O. Woodbury	Clerk and agent, board of health.
Boston	*Francis X. Mahoney, D. V. M., M. D.	Health commissioner.
	*Joseph A. Cahalan	Secretary.
Divisions:		
Medical	*M. Victor Safford, M. D.	Deputy commissioner.
Communicable diseases	*Frederick J. Bailey, M. D.	Do.
Bacteriological laboratory.	*Karl R. Bailey, M. D.	Do.
Food	*P. H. Mullowney, D. V. M.	Do.
Child hygiene	Charles F. Wilinsky, M. D.	Do.
Sanitary	*M. Victor Safford, M. D.	Acting deputy commissioner.
Tuberculosis	*George O'Donnell, M. D.	Deputy commissioner.
Vital statistics	*Joseph W. Monahan	Do.
Braintree	Mortimer N. Peck	Agent, board of health.

City	Name of health officer	Official title
Massachusetts—Continued.		
Brockton	David B. Tuholski, M. D	Health officer.
Brookline	Francis Parkman Denny, M. D	Do.
Cambridge	Simon B. Kelleher, M. D	Medical inspector.
Chelsea	*John F. Welch	Health officer.
Chicopee	*Gertrude M. De Witt	Agent, board of health.
Clinton	*Frederick E Murphy	Health officer.
Danvers	*Hugo Nappe, R N	Health officer and milk inspector.
Dedham.	Thomas J Brennan	Health inspector.
Easthampton	C. C. Buckner	Agent, board of health.
Everett	*William F. Hogan	Do
Fairhaven	*W. Fred Delano	Secretary, board of health.
Fall River	*Ernest M. Morris, M. D	Health commissioner.
Fitchburg	*Fred R. Brigham	Agent, board of health.
Framingham	*David Moxon, C. P. H	Do.
Gardner		
Gloucester	George S. Rust, M D	Physician to board of health.
Greenfield	*George P. Moore	Agent, board of health.
Haverhill		
Holyoke	*Daniel P. Hartnett	Health officer.
Lawrence	*Daniel J. Costello	Clerk, board of health.
Leominster	Hugh E. Crain	Agent, board of health.
Lowell	*John J. McNamara, M. D., S. E	Director of health.
Lynn	James A. Dumas, M. D	Commissioner of public health.
Malden	*May C. Welsh	Clerk and agent, board of health.
Marlborough		
Medford	William N. Lanigan, M. D	Medical inspector.
Melrose	Clarence P. Holden, M. D	Chairman, board of health.
Methuen	John Oddy, M. D	Board of health physician.
Milford	Clifton Tyler	Secretary, board of health.
Milton	Paul W. Kimball, M. D	Agent, board of health.
Natick	Charles D. Colford, D. M. D.	Do
Needham	*G. Donald Buckner, B. S. in P. H.	Health officer.
New Bedford	*William G. Kirschbaum	Agent and executive officer.
Newburyport	*W. N. O'Brien, Ph.C	Agent, board of health.
Newton	*Francis George Curtis, M. D	Chairman, board of health.
North Adams	*Douglas W. Hyde, S. E	Agent, board of health.
North Attleboro	Michael E. Vance, M. D	Health officer and secretary.
Northampton	*George R. Turner	Agent, board of health.
Norwood	John A. Shannon	Do
Peabody	*Percy F. Murray	Do.
Pittsfield	*Willys M. Monroe, M. D	Health commissioner.
Plymouth		
Quincy	Edmund B. Fitz Gerald, M. D	Health commissioner.
Revere	Francis Licata, M. D	Chairman, board of health.
Salem	*John J. McGrath	Agent, board of health.
Saugus	Henry O. Westendarp	Chairman, board of health.
Somerville	Frank L. Morse, M. D	Medical inspector and bacteriologist.
Southbridge	*Albert R. Brown	Agent, board of health.
Springfield	*Jacob R. Sackett	Do.
Stoneham	*George A. Hinchcliffe	Secretary-health officer.
Swampscott	*Clarence W. Horton	Health officer.
Taunton	John I McNamara, M. D	Chairman, board of health.
Wakefield	David Taggart	Health officer and agent.
Waltham		
Watertown	*Fred W. Bodge.	Health officer.
Webster.	Daniel Casey, M. D	Chairman, board of health.
Wellesley.	Curtis M. Hilliard	Supervisor of health.
West Springfield	John J. Lysaght	Agent, board of health.
Westfield	Robert M. Marr, M. D	Chairman, board of health.
Weymouth	F. L. Doucett, M. D	Clerk, board of health.
Winchester.	*Maurice Dinneen.	Agent, board of health.
Winthrop	*William D. Childress	Health officer.
Woburn	*Edward F. Gorman	Agent and secretary, board of health and charities.
Worcester	*Peter Owen Shea, M. D	Director of health and school hygiene.
Michigan:		
Adrian	W. S. Mackenzie, M. D	City health officer.
Alpena	Francis J. O'Donnell, M. D.	Health officer.
Ann Arbor.	John A. Wessinger, M. D., Dr. P. H.	Do.
Battle Creek	*A. A. Hoyt, M. D	Health officer and registrar.
Bay City	G. W. Moore, M. D	Health officer.
Benton Harbor	Edwin Roy Taylor, M. D	Director of public health.
Dearborn	C. A. Christensen, M. D	Commissioner of health and sanitation.
Detroit	Board of health:	
	William M. Walker	President.
	William A. Evans, M. D	Vice President.
	Ledru O. Geib, M. D	
	Gustavus D. Pope	

City	Name of health officer	Official title
Michigan—Continued.		
Detroit	Executive staff, department of health	
	*Henry F. Vaughan, Dr. P. H.	Commissioner of health.
	Bert U. Easterbrook, M. D.	Deputy commissioner.
	*Fred M. Meader, M. D.	Deputy commissioner and secretary.
	*Don W. Gudakunst, M. D.	Deputy commissioner and medical director.
	*Joseph A. Kasper, M. D.	Director of laboratories.
	A. C. Thompson, D. D. S.	Director of school dental service.
	*Miss Grace Ross, R. N.	Superintendent of nursing.
	Russell W. Alles, M. D.	Director of prenatal division.
	*John F. Roehl	Director of special investigation.
	*R. S. Dixon, M. D.	Director, social hygiene division.
	Bruce H. Douglas, M. D.	Tuberculosis controller.
	*George E. Phillips	Superintendent of Herman Kiefer Hospital.
	*Henry S. Williams	Superintendent of William H. Maybury Sanatorium.
	*F. Gardner Legg, C. E.	Director of sanitary engineering.
	*Edward C. Schultz	Director of dairy and food inspection.
	*Arthur P. Derby	Director of division of tuberculosis.
	*G. Arthur Blakeslee	Director of division of vital statistics.
	*John E. Gordon, M. D.	Medical director and epidemiologist of Herman Kiefer Hospital.
Ecorse	Lawrence H. Van Becelaere, M. D.	Health officer.
Escanaba		
Fern Isle	Willard G. Beattie, M. D.	Do.
Flint	*Kenneth B. Moore, M. D.	Do.
Grand Rapids	*Allison H. Edwards, M. D.	Do.
Grosse Pointe		
Hamtramck	Peter E. Bolewicki, M. D.	Health commissioner.
Highland Park	William N. Braley, M. D.	Health officer.
Holland	William Westrate, M. D.	Do.
Iron Mountain	James L. Browning, M. D.	Do.
Ironwood	C. C. Urquhart, M. D.	City health officer.
Jackson	*Floyd R. Town, M. D.	Health officer.
Kalamazoo	*John L. Lavan, M. D.	Director of public health.
Lansing	*E. R. Van der Slice, M. D.	Director, department of public health.
Lincoln Park	H. K. Butterworth, M. D.	Health officer.
Marquette	*Frederick McD. Harkin, M. D.	City health officer.
Menominee	John T. Kaye, M. D.	Health officer.
Monroe	James A. Humphrey, M. D.	City health officer.
Mount Clemens	W. J. Kane, M. D.	Health officer.
Muskegon	M. E. Stone, M. D.	Do.
Muskegon Heights	O. M. La Core, M. D.	Do.
Niles	Lawrence M. Rutz, M. D.	Commissioner of health.
Owosso	W. E. Ward, M. D.	Health officer.
Pontiac	*Charles A. Neafie, M. D.	Director of public health.
Port Huron	A. L. Callery, M. D.	Health officer.
River Rouge	Harvey S. Broderson, M. D.	City health officer.
Royal Oak	Donald A. Cameron, M. D.	Do.
Saginaw	*Frank A. Poole, M. D.	Do.
Sault Ste. Marie	E. A. Cornell, M. D.	Health officer.
Traverse City	G. A. Holliday, D. D. S., M. D.	Do.
Wyandotte	Earl H. Engel, M. D.	Do.
Ypsilanti	Bradley M. Harris, M. D.	Do.
Minnesota:		
Albert Lea	D. S. Branham, M. D.	Do.
Austin	Peter A. Lommen, M. D.	Chairman, board of health.
Brainerd	V. E. Quanstrom, M. D.	City health officer.
Duluth	*M. McC. Fisher, M. D.	Director of public health.
Faribault	Frederick U. Davis, M. D.	Health commissioner.
Hibbing	C. N. Harris, M. D.	Chairman, board of health
Mankato	William A. Beech, M. D.	Health commissioner.
Minneapolis	*Francis Edward Harrington, LL. D., M. D.	Commissioner of health.
Rochester	C. H. Mayo, M. D.[1]	Health officer.
St. Cloud	H. W. Goehrs, M. D.	City physician.
St. Paul	Robert B. J. Schoch, M. D.	Health officer.
South St. Paul	O. S. Ely, M. D.	Commissioner of health.
Virginia	J. Arnold Malmstrom, M. D.	Health officer.
Winona	William V. Lindsay, M. D.	Do.
Mississippi:		
Biloxi		
Clarksdale	*V. B. Harrison, M. D.	Director, county health department.
Columbus		
Greenville	*John W. Shackelford, M. D., M. P. H.	Do.
Greenwood	*Levi A. Barnett, M. D.	Director of health.
Gulfport	Daniel J. Williams	County health officer.

[1] D. C. Lockhead, M. D., D. P. H., deputy health officer, full time.

City	Name of health officer	Official title
Mississippi—Continued		
Hattiesburg	*B. D. Blackwelder, M. D., C. P. H.	Director, county health department.
Jackson	*William Earl Noblin, M. D.	City and county health officer.
Laurel	T. R. Beech, M. D.	County health officer.
McComb	*T. Paul Haney, Jr., M. D., C. P. H.	Do.
Meridian	*D. V. Galloway, M. D., M. P. H.	Director of health.
Natchez	*A. R. Perry, M. D., M. P. H.	Director, county health department.
Vicksburg	*F. Michael Smith, M. D.	Do.
Missouri:		
Cape Girardeau	*Lee Slaten	Sanitary inspector.
Columbia	*W. A. Norris, M. D.	City health commissioner.
Hannibal	E. M. Lucke, M. D.	Health officer.
Independence	Fountain L. Cook, M. D.	City physician.
Jefferson City	J. G. Bruce, M. D.	Do.
Joplin	A. Benson Clark, M. D.	Commissioner of health.
Kansas City		
Maplewood		
Moberly	C. C. Smith, M. D.	City health officer.
St. Charles	L. E. Belding, M. D.	City physician.
St. Joseph	A. J. Smith, M. D.	Health officer.
St. Louis	*Jos. F. Bredeck, M. D., D. P. H.	Health commissioner.
	*W. Scott Johnson	Sanitary engineer.
	*H. I. Spector	Tuberculosis controller.
	*Joseph C. Willett, D. V. M.	Chief of laboratories.
	*John S. Koen, D. V. S.	Chief of food control.
	*Ernest C. McCulloch, D. V. M.	Milk controller.
	*Walter E. Cook	Field supervisor.
	*Harry M. Stamm, D. D. S.	Dental supervisor.
	*A. L. Kavanagh, M. D.	Chief of venereal clinic.
	*Mildred Sanderson, R. N.	Municipal nurses' supervisor.
	*Harvey Chope	Epidemiologist.
	*Milton R. Fisher, D. V. M.	Veterinary milk inspector.
	*W. C. Dillard, D. V. M.	Veterinary meat inspector.
	*H. V. Persells, D. V. M.	Do.
	*C. B. Michel, D. V. M.	Do.
	*Downey L. Harris, M. D.	Rabies controller.
	*Elizabeth Brezu	Vital statistician.
	*Thomas Chamberlain	Recorder of births and deaths.
Sedalia		
Springfield	*Ralph W. Langston	Commissioner of health and sanitation.
University City	O. P. Hampton, Jr., M. D.	Health commissioner.
Webster Groves	Carl C. Irick, M. D.	Do.
Montana:		
Anaconda	John J. Malee, M. D.	City physician.
Billings	E. G. Balsam, M. D.	Secretary, board of health.
Butte	J. J. Kane, M. D.	City physician.
Great Falls	*F. L. Watkins, M. D.	Health officer.
Helena	*W. M. Copenhaver, Jr., M. D.	City-county health officer.
Missoula	*F. D. Pease, M. D.	Health officer.
Nebraska:		
Beatrice	T. R. Leibee, M. D.	City physician.
Fremont	Joshua S. Devries, M. D.	Do.
Grand Island	John G. Woodin, M. D.	Do.
Hastings	E. J. Latta, M. D.	Do.
Lincoln	*M. F. Arnholt, M. D.	Superintendent of health.
Norfolk	V. L. Siman, M. D.	City physician.
North Platte	J. B. Redfield, M. D.	Do.
Omaha	*Millard Langfeld, M. D.	Director of public health.
Nevada:		
Reno	A. F. Adams, M. D.	Secretary, board of health.
New Hampshire:		
Berlin	*Eli A. Marcoux, B. S. in Ch. and sanitation.	Health officer and milk inspector.
Claremont	William P. Prescott	Health officer.
Concord	*Travis Pollard Burroughs, M. D., C. P. H.	Sanitary officer.
Dover	*William E. Whiteley, M. D.	Executive officer.
Keene	Arthur A. Pratt, M. D.	Health officer.
Laconia		
Manchester	*Howard A. Streeter, M. D.	Do.
Nashua	Deering G. Smith, M. D.	Chairman, board of health.
Portsmouth	L. R. Hazzard, M. D.	Do.
Rochester	Charles E. Goodwin	Health officer.
New Jersey:		
Asbury Park	*Budd H. Obert	Do.
Atlantic City	Samuel L. Salasin, M. D.	Do.
Bayonne	William W. Brooke, M. D.	Do.
Belleville	*Eugene T. Berry	Do.
Bloomfield	*Joseph C. Saile, Ph. G., D. V. S., D. O.	Do.
Bridgeton	*John G. Robbins	Do.

City	Name of health officer	Official title
New Jersey—Continued.		
Burlington	Kathryn Phillips	Health officer and secretary.
Camden	Arthur L. Stone, M. D.	Director of public health.
Carteret		
Cliffside Park	Fred J. Dyer	Health officer.
Clifton	Jeremiah P. Quinlan	Do.
Collingswood	Harold K. Eynon, M. D	Do.
Dover	*John G. Taylor	Do.
East Orange	*Frank J. Osborne, C. P. H	Health officer and registrar.
Elizabeth	Louis J. Richards, S. B. in S. E	Health officer.
Englewood	*Henry R. H. Nicholas	Do.
Garfield	Charles Bleasby, M. D	Do.
Gloucester City	J. Alonzo Beck, M. D	Do.
Hackensack	*L. Van D. Chandler	Do.
Harrison	*John T. McClure	Do.
Hawthorne	William Missouellie, M. D	Do.
Hoboken	Joseph F. X. Stack, M. D	Health commissioner.
Irvington	*William S. Bailey	Acting health officer.
Jersey City	*James J. Hagan	Health officer and secretary.
Kearny	*Amos Field, Jr	Health officer.
Linden	*Maidie E. Noe	Do.
Lodi	Henry H. Brevoort, M. D	Do.
Long Branch	*R. C. Errickson	Do.
Millville	Richard H. Knowles	Do.
Montclair	*Carl T. Pomeroy, C. P. H	Do.
Morristown	*John F. Kilkenny	Do.
New Brunswick	E. Irving Cronk, M. D	City health officer.
Newark	*Charles Vaughan Craster, M. D., D. P. H.	Health officer.
Nutley		
Orange	William M. Brien, M. D	Acting health officer and registrar of vital statistics.
Passaic	John N. Ryan, M. D	Health officer.
Paterson	*Frederick P. Lee, M. D	Do.
Perth Amboy	*Charles S. Thompson, D. V. S	Do.
Phillipsburg	William Dana Pursel, D. D. S., M. D	Town physician.
Plainfield	*Andrew J. Krog	Health officer and secretary.
Pleasantville	Robert M. Grier, M. D	Health inspector.
Rahway	*Fred M. Williams	Executive officer.
Red Bank	William H. Lawes, Jr., V. S	Sanitary inspector.
Ridgefield Park	*William F. Reynolds, D. V. M	Health officer.
Ridgewood	H. H. Pettit, M. D	Do.
Roselle	Perry Alexander Proudfoot, M.D.	Do.
Rutherford	*Marine Dunn	Do.
South Orange	A. C. Benedict, M. D	Sanitary inspector.
South River	A. A. Pansy, M. D	Do.
Summit	Henry Paul Dengler, M. D	Executive officer.
Trenton	*Alton S. Fell, M. D	Health officer.
Union City	Grant P. Curtis, M. D	Do.
West New York	*Randolph Kunze	Chief inspector.
West Orange	*D. E. Buckley	Health officer.
Westfield	*Andrew Carney	Executive officer.
New Mexico:		
Albuquerque	*C. Howe Eller, M. D., Dr. P. H	County health officer.
Roswell	W. W. Phillips, M. D	County and city health officer
Santa Fe		
New York:		
Albany	*Daniel V. O'Leary, M. D.	Commissioner of health.
Amsterdam	Patrick J. Fitzgibbons, M. D	Health officer.
Auburn	John W. Copeland, M. D	Do.
Batavia	Emory F. Will, M. D	Do.
Beacon	Charles B. Dugan, M. D	Do.
Binghamton	C. J. Longstreet, M. D	Do.
Buffalo	*Francis E. Fronczak, LL. D., M D., Dr. Sc. P. H.	Health commissioner.
	*Edward Durney, M. D	Deputy health officer.
	*Charles A. Bentz, M. D	Do.
Division of child hygiene	*Edward Durney, M. D	Director.
Communicable disease and division of laboratories.	*Charles A. Bentz, M. D	Do.
Division of vital statistics	*Delmer E. Batcheller	Registrar of vital statistics.
Division of sanitation	Frank E. Trumble	Assistant chief inspector.
Division of smoke abatement	do	Do.
Division of food inspection	*Willard B. Diebold	Do.
Cohoes	E. M. Bell, M. D	Commissioner of health.
Corning	Henry E. Elwood, Jr., M. D	Health officer.
Cortland	*D. R. Reilly, M. D., C. P. H	County commissioner of health.
Dunkirk	Edgar Bieber, M. D	Health officer.
Elmira	Reeve B. Howland, M. D	Do.
Endicott	Mark W. Welch, M. D	Do.
Floral Park	Arthur E. Goldfarb, M. D	Do.
Freeport	William H. Runcie, M. D	Do.
Fulton	L. A. Simpson, M. D	Do.

City	Name of health officer	Official title
New York—Continued.		
Geneva	C. W. Grove, M. D.	Health officer.
Glen Cove	Joseph B. Conolly, M. D.	Do.
Glens Falls	Virgil D. Selleck, M. D.	Do.
Gloversville	Alex L. Johnson, M. D.	Do.
Hempstead	William H. Runcie, M. D.	Do.
Herkimer	James W. Graves, M. D.	Do.
Hornell	George E. Taylor, M. D.	Do.
Hudson	Louis Van Hoesen, M. D.	County commissioner of health.
Ithaca	*Lewell T. Genung, M. D.	Health officer.
Jamestown	William M. Sill, M. D.	Superintendent of public health.
Johnson City	Rollin O. Crosier, M. D.	Health officer.
Johnstown	Guy Vail Wilson, M. D.	Commissioner of public health and welfare.
Kenmore	E. R. Linklater, M. D.	Health officer.
Kingston	Lester E. Sanford, M. D.	Do.
Lackawanna	Leo M. Michalek, M. D.	Do.
Little Falls	George S. Eveleth, M. D.	Do.
Lockport	George H. Barone, M. D.	Do.
Lynbrook	F. M. Galloway, M. D.	Do.
Mamaroneck	Edward M. Clark, M. D.	Do.
Massena	Charles E. Elkins, M. D.	Do.
Middletown	H. J. Shelley, M. D.	Do.
Mount Vernon	F. W. Shipman, M. D.	Commissioner of health.
New Rochelle	*Bertrand F. Drake, M. D., Dr. P. H.	Health officer.
New York	*John L. Rice, M. D.	Commissioner of health.
	*William H. Best, M. D.	Deputy commissioner of health.
Bureau—		
General administration	*George T. Palmer, Dr. P. H.	Secretary.
Records	*Thomas J. Duffield	Director.
Sanitation	*John Oberwager, M. D.	Acting sanitary superintendent.
Preventable diseases	*Victor Mildenberg, M. D.	Acting director.
Child hygiene	*John Blumenthal, M. D., Dr. P. H.	Director.
Nursing	*Miss Amelia H. Grant, R. N.	Do.
Public health education	*Charles F. Bolduan, M. D.	Do.
Laboratories	*William H. Park, M. D.	Do.
Food and drugs	*Max A. Herzog, M. D.	Acting director.
District health administration.	*Margaret W. Barnard, M. D., C. P. H.	Director.
Tuberculosis	*Herbert R. Edwards, M. D.	Do.
Newburgh	Thomas J. Burke, M. D.	Health officer.
Niagara Falls	Edward E. Gillick, M. D.	Do.
North Tonawanda	Henry C. Lapp, M. D.	Do.
Ogdensburg	Frederick E. Clark, M. D.	Do.
Olean	Joseph P. Garen, M. D.	Do.
Oneida	Edmund L. Finley, M. D.	Do.
Oneonta		
Ossining		
Oswego	James E. Mansfield, M. D.	Do.
Peekskill	J. Douglas Barry, M. D.	Do.
Plattsburg	Leo F. Schiff, M. D.	Do.
Port Chester	*William J. Sheehan, M. D.	Do.
Port Jervis	G. Otto Pobe, M. D.	Do.
Poughkeepsie	*William H. Conger, M. D.	Do.
Rensselaer		
Rochester	*Arthur M. Johnson, M. D.	Do.
Rockville Center	Arthur D. Jacques, M. D.	Health commissioner.
Rome	Lewis N. Eames, M. D.	Health officer.
Saratoga Springs	Frederic J. Resseguie, M. D.	Do.
Schenectady	Fred J. MacDonald, M. D.	Commissioner of health.
Syracuse	H. B. Doust, M. D.	Acting commissioner of health.
Tonawanda	Russell H. Wilcox, M. D.	Health officer.
Troy	James H. Flynn, M. D.	Commissioner of health.
Utica	*Hugh H. Shaw, M. D.	Health officer.
Valley Stream	John M. Quinn, M. D.	Do.
Watertown	G. B. Van Doren, M. D.	City health officer.
Watervliet	C. A. Birmingham, M. D.	Commissioner of health.
White Plains	*Matthias Nicoll, Jr., M. D.	County commissioner of health.
Yonkers	*Clarence W. Buckmaster, M. D., C. P. H.	Health commissioner.
North Carolina:		
Asheville	*D. E. Sevier, M. D.	Health officer.
Charlotte	*G. L. Rea, M. D.	City health officer.
Concord	*Daniel Greenlee Caldwell, M. D.	County health officer.
Durham	*Jesse H. Epperson	Superintendent of health.
Elizabeth City	Ivie Alphonso Ward, M. D.	City health officer.
Fayetteville	*Malcolm T. Foster, M. D., C. P. H.	Do.
Gastonia	Mc. G. Anders, M. D.	City physician and health officer.
Goldsboro	*G. Fletcher Reeves, M. D.	Director of public health.
Greensboro	*C. C. Hudson, M. D.	Health officer.
High Point	W. J. McAnally, M. D.	Do.

City	Name of health officer	Official title
North Carolina—Continued.		
Kinston	*Z. V. Moseley, M. D	County health officer.
New Bern	N. M. Gibbs, M. D	County and city physician.
Raleigh	*A. C. Bulla, M. D.	County and city health officer.
Rocky Mount	*Roy Norton, M. D	Superintendent of health.
Salisbury	*Charles W. Armstrong, M. D.	Health officer.
Shelby	D. F. Moore, M. D	County physician.
Statesville	Ross S. McElwee, M. D	County health physician.
Thomasville		
Wilmington	*A. H. Elliot, M. D	County health officer.
Wilson	* W. H. Anderson, M. D	City and county health officer.
Winston-Salem	*R. L. Carlton, M. D	City health officer.
North Dakota:		
Bismarck	A. M. Fisher, M. D	Do.
Fargo	*B. K. Kilbourne, M. D	Do.
Grand Forks	Jalmar M. Hofto, M. D	Do.
Minot	J. L. Devine, M. D	Do.
Ohio:		
Akron	*Melville D. Ailes, LL. B., M. D	Director of health.
Alliance	G. O. Rowland, M. D	Health commissioner.
Ashland	Robert P. Bogniard, M. D	Director of welfare.
Ashtabula	James H. Park, M. D	Health officer.
Barberton	H. A Funfrock, M. D	Health commissioner.
Bellaire	William J. Shepard, M. D	Do.
Bucyrus	W. G. Carlisle, M. D	Do.
Cambridge	Carl M. Oshe	Do.
Campbell	James S. Mariner, M. D	Do.
Canton	Frank M. Sayre, M. D	Do.
Chillicothe	*Raymond E. Bower, Ph. B., M. D.	Do.
Cincinnati	*Owen C. Fisk, M. D	Acting commissioner of health.
Cleveland	*Harold J. Knapp, M. D	Commissioner.
Division:		
Communicable diseases	T. G. Duncan, M. D	Director.
Tuberculosis	E. P. Edwards, M. D	Do.
Child hygiene	R. J. Ochsner, M. D	Do.
Food and drug administration.	E. B. Buchanan	Do.
Laboratories	E. B. Buchanan	Do.
Public health nurses	Cora M. Templeton, R. N	Do.
Cleveland Heights	*Robert Lockhart, M. D	Director of health.
Columbus	*Nelson C. Dysart, Ph. C., M. D	Health commissioner.
Coshocton	*D. M. Criswell, M. D	Do.
Cuyahoga Falls	*R. H. Markwith, M. D	Do.
Dayton	*A. O. Peteres, M. D	Do.
East Cleveland	George W. Stober, M. D	Director of health.
East Liverpool	Roy C. Costello, M. D	Health commissioner.
Elyria	G. E. French, M. D	Do.
Euclid	*Robert Lockhart, M. D	District health commissioner.
Findlay	*Martha Laffey, R. N	Health commissioner.
Fostoria	*L. W. Gibson	Do.
Fremont	E. L. Vermilya, M. D	Do.
Garfield Heights	*Robert Lockhart, M. D.	District health commissioner.
Hamilton	*C. J. Baldridge, B. L., M. D	Health commissioner.
Ironton	H. S. Allen, M. D	Do.
Lakewood	Wallace J. Benner, M. D	Commissioner of health.
Lancaster	Clifford B. Snider, M. D	Health commissioner.
Lima	James B. Poling, M. D	Do.
Lorain	Valloyd Adair, M. D	Do.
Mansfield	*Millard C. Hanson, M. D., Dr. P. H.	Do.
Marietta	F. S. McGee, M. D	Do.
Marion	Kenneth D. Smith, M. D	Do.
Martins Ferry	*John Donovan	Do.
Massillon	*Dwight L. Fisher	Acting health commissioner.
Middletown	*George D. Lummis, M. D	Health commissioner.
New Philadelphia	*Joseph Blickensderfer, M. D	Do.
Newark	W. H. Knauss, M. D	Do.
Niles	W. A. Werner, M. D	Do.
Norwood	*Louis O. Saur, M. D	Do.
Painesville	*Mrs. Clara C. Wilder, R. N	Do.
Parma	*Robert Lockhart, M. D	Do.
Piqua	L. G. Whitney	Do.
Portsmouth	O. D. Tatje, M. D	Do.
Salem	R. T. Holzbach, M. D	Do.
Sandusky	*F. M. Houghtaling, M. D	Do.
Shaker Heights	Paul Marcus Spurney, M. D	Director of health.
Springfield	*Oscar M. Craven, M. D	Do.
Steubenville	*Julius A. Pizzoferrato	Health commissioner.
Struthers	Charles Scofield, M. D	Do.
Tiffin	J. A. Gosling, M. D	Do.
Toledo	Basil B. Brim, M. D	Do.
Warren	M. T. Knappenberger, M. D	Do.
Wooster	*W. G. Rhoten, M. D	Do.
Xenia	A. D. De Haven, M. D	Do.

City	Name of health officer	Official title
Ohio—Continued.		
Youngstown	Coyt H. Beight, M. D	Health commissioner.
Zanesville	D. G. Candy, M. D	Superintendent of health and sanitation.
Oklahoma:		
Ada	O. E. Welborn, M. D	City health officer
Ardmore	Ambert Y Easterwood, M. D	City physician.
Bartlesville	Elizabeth Chamberlin, M. D	City superintendent of health.
Chickasha	*E. L. Dawson, M. D	Superintendent of health
Enid	R. C. Baker, M. D	City superintendent of health
Lawton	*Fratis L. Duff	Health officer.
McAlester	Charles M Pearce, M D	Superintendent of health.
Muskogee	I. T. Woodburn, M. D	City physician.
Oklahoma City	*Walter H Miles, M. D	Director of health.
Okmulgee	Raymond De Voy	Sanitary inspector.
Ponca City		
Sapulpa	*A. C. Frampton, D. V. S	City health officer.
Seminole		
Shawnee	Leroy J. Neal, M. D	City superintendent of health.
Tulsa	J. Jeff Billington, M. D	Superintendent of health.
Wewoka	George Hunter, M. D	City and county health officer.
Oregon:		
Astoria	N. S. Vernon, M. D	Do.
Eugene	*Ronald C. Romig, M. D	Do.
Klamath Falls	A. A. Soulé, M. D	Health officer and city physician.
Medford	L. D. Inskeep	City health officer.
Portland	*John G. Abele, M. D	Do.
Salem	*V. A. Douglas, M. D	City-county health officer.
Pennsylvania:		
Aliquippa	*J. E. Tanner	Health officer.
Allentown	*J. Treichler Butz, D. D. S., M. D	Do.
Altoona	*Raymond A. Herbert	Superintendent of health.
Ambridge	*Louis Herrmann	Health officer.
Arnold	Frank E. Morrison	Secretary, board of health.
Beaver Falls	*William Elmes, M. E	Health officer.
Bellevue	*James B. Arthur	Do.
Berwick	*Charles E. Ross	Do.
Bethlehem	F. J. Conahan, M. D	City physician.
Braddock	*James E. Wills	Health officer.
Bradford	*R. O. Vogel	Do.
Bristol	John M. Wright	Do.
Butler	*J. Fred Leetch	Do.
Canonsburg	*Frank Milligan	Do.
Carbondale	*Paul Nelson	Do.
Carlisle	*U. Grant Eppley	Do.
Carnegie		
Chambersburg	*Frank J. Croft	Health officer and secretary.
Charleroi	*J. M. Hill	Health officer.
Chester		
Clairton	*F. F. Keller	Do.
Coatesville	Charles V. Peace, V. M. D	Health officer and milk inspector.
Columbia		
Connelsville	*D. E. Minerd	Health officer and sealer of weights and measures.
Conshohocken	Thomas S. White	Health officer and secretary.
Coraopolis	*Henry N. Holdren, Jr	Health officer.
Dickson City		
Donora	*Herman Lang	Do.
Dormont	*Henry Crystal	Do.
Du Bois	J. I. Brockbank, M. D	Do
Dunmore	William Ferrese	Do.
Duquesne	*C. W Goldstrohm	Do.
Easton	Joseph Samuel Cohen, M. D	City health officer.
Ellwood City	*Lewis Young	Meat and milk inspector.
Erie	*J. R. Smith, M. D	Health officer.
Farrell	*Benjamin F. Davis	Do.
Franklin		
Greensburg	Joseph B. Cherry	Do.
Hanover	Henry F. Gocken, M. D	Health officer and secretary, board of health.
Harrisburg	John M. J. Raunick, M. D	Health officer.
Hazelton	*William Pfaff	Do.
Homestead	*M. D. Weis and J. J. Baird	Do.
Jeannette	*Charles E. Walter	Chief health officer.
Johnstown	L. W. Jones, M. D	City health officer.
Kingston	*J. F. Seward	Health officer.
Lancaster	*Benjamin F. Charles	Do.
Latrobe	W. T. Osborne	Do.
Lebanon		
Lewistown	H. E. Fetterolf	Do.
McKeesport	*Daniel F. Marsh	Do.
McKees Rocks		
Mahanoy City	*Harry Martin	Do.
Meadville		

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City	Name of health officer	Official title
Pennsylvania—Continued.		
Monessen	*F. E. Gibson	City health officer.
Mount Carmel	*Charles F. Cohoon	Health officer.
Munhall	W. J. Caddy	Secretary, board of health.
Nanticoke	*Judd H. Abbott	Health officer.
New Castle	William L. Steen, M. D.	Do.
New Kensington	*John E. Evans	Health and ordinance officer.
Norristown	*R. Ronald Dettre	Health officer and secretary.
North Braddock	*Michael J. Pastor	Health officer.
Oil City	*William J. Lewis	Do.
Old Forge	Primo Cesare	Chief of police.
Olyphant	Andrew Taras	Borough health officer.
Philadelphia:		
Department of public health.	*J. Norman Henry, M. D.	Director, department of public health.
	———	Assistant director, department of public health.
Bureau of health	*William J. Wolf	Secretary.
Bureau of hospitals:		
Philadelphia General Hospital, 34th and Pine Streets.	*William G. Turnbull, M. D.	Superintendent.
Philadelphia Hospital for Contagious Diseases, 2d and Luzerne Streets.	*Pascal F. Lucchesi, M. D.	Acting superintendent.
Philadelphia Hospital for Mental Diseases, Byberry.	*James P. Sands, M. D.	Superintendent.
Phoenixville	*Russell E. Deery	Health officer.
Pittsburgh	*Ray P. Moyer, M. D., Ph. G.	Director.
Bureau of infectious diseases (including municipal and tuberculosis hospitals).	*P. E. Marks, M. D.	Superintendent.
Bureau of sanitation	*George W. Schusler, C. E.	Do.
Bureau of child welfare	*H. J. Benz, M. D.	Do.
Bureau of food inspection	*Leicester Patton	Do.
Bureau of smoke regulation.	*H. B. Meller, C. E.	Do.
Pittston	*Michael A. McHale	Health officer.
Plymouth	H. G. Templeton, M. D.	Do.
Pottstown	*A. John André	Do.
Pottsville	*A. C. Huntzinger	Do.
Reading	*Ira J. Hain, M. D.	Do.
Scranton	Arthur E. Davis, M. D.	Director, department of public health.
Shamokin	*Frederick Zeiser	Borough health officer.
Sharon	*Joseph S. Hildebrand	Sanitary officer.
Shenandoah	*Claude Davis, Ph. G.	Health officer.
Steelton	*E. G. Butler	Do.
Sunbury	*Carl P. Inkrote	Do.
Swissvale	*S. L. Glasgow	Do.
Tamaqua	Lamont Perrine	Do.
Taylor	E. E. Edwards, M. D.	Do.
Turtle Creek	*Manuel Emmanuel	Do.
Uniontown	*W. C. Hall	City health officer.
Vandergrift	J. D. Remaley	Health officer.
Warren	*Ralph N. Brown	Do.
Washington		
Waynesboro	*Perez H. Snowberger	Do.
West Chester	Warren T. Garrett	Do.
Wilkes-Barre	*Charles Briggs Crittenden, M. D., C. H. P.	City health officer.
Wilkinsburg	*J. M. Snyder	Health officer
Williamsport	*W. J. Mollenkopf	Do.
York	J. Frank Small, M. D.	Director of public health.
Rhode Island:		
Bristol	Daniel E. Dwyer	Health officer.
Central Falls	Charles S. Doucet, M. D.	Health superintendent.
Cranston	Daniel S. Latham, M. D.	Superintendent of health and inspector of milk.
East Providence	W. H. T. Hamill, M. D.	Health officer.
Newport	Edward V. Murphy, M. D.	Commissioner of health.
North Providence	Herbert A. Brown	Health officer.
Pawtucket	Albert L. Vandale, M. D.	Superintendent of health.
Providence	*Dennett L. Richardson, M. D.	Do.
Warwick	*Lawrence Jackson Smith, M. D.	Do.
West Warwick	Daniel S. Harrop, M. D.	Health officer.
Westerly	Samuel C. Webster, Ph. G., M. D.	Superintendent of health.
Woonsocket	Thomas S. Flynn, M. D.	Health officer.
South Carolina:		
Anderson	*E. E. Epting, M. D.	City and county health officer
Charleston	*Leon Banov, M. D.	City-county health officer.
Columbia	Paul Eugene Payne, M. D.	City health officer.

City	Name of health officer	Official title
South Carolina—Continued.		
Florence	*George D. Heath, M. D., Dr. P. H.	Health commissioner.
Greenville	*Irvine Sydnor Barksdale, M. D.	Commissioner of health.
Greenwood	*Joseph E. Brodie, M. D.	County health officer.
Rock Hill		
Spartanburg		
Sumter	*G. R. Kitchen, D. V. M.	City health officer.
South Dakota:		
Aberdeen	John F. Adams, M. D.	Do.
Huron		
Mitchell	E. M. Young, M. D.	Do.
Rapid City	*Forrest J. Austin, M. D.	County health officer.
Sioux Falls	E. E. Gage, M. D.	Health officer.
Watertown	W. G. Magee, M. D.	City health officer.
Tennessee:		
Bristol		
Chattanooga	*Fred C. McIsaac, M. D.	Director of health.
Jackson	J. D. Johnson	Commission of health and sanitation.
Johnson City	*Wallace L. Poole, M. D., M. S. P. H.	Director of city health department.
Kingsport	*F. L. Moore, M. D., C. P. H.	Director, county health department.
Knoxville	*William Howard Enneis, M. D.	City health officer.
Memphis	*L. M. Graves, M. D.	Superintendent, Memphis health department.
Nashville	*John Overton, M. D.	City health officer.
Texas:		
Abilene	Scott W. Hollis, M. D.	County and city health officer.
Amarillo	*Benjamin M. Primer, M. D., M. P. H.	Director, city-county health unit.
Austin	*Eugene O. Chimene, M. D.	Director of public health.
Beaumont	W. W. Dunn, M. D.	City health officer.
Big Spring	M. H. Bennett, M. D.	Do.
Brownsville	Thurman A. Kinder, Jr., M. D.	Do.
Brownwood	J. M. Horn, M. D.	Do.
Cleburne	Joseph M. Stallcup, M. D.	Do.
Corpus Christi	N. D. Carter, M. D.	Do.
Corsicana	William T. Shell, Jr., M. D.	Do.
Dallas	*J. W. Bass, M. D.	Director of public health.
Del Rio	D. A. York, M. D.	City health officer.
Denison	W. A. Lee, M. D.	Do.
El Paso	*T. J. McCamant, M. D.	Director, city-county health unit.
Fort Worth	*A. H. Flickwir, M. D.	Director of public health and welfare.
Galveston	Walter Kleberg, M. D.	City health officer.
Greenville	B. F. Arnold, M. D.	Do.
Harlingen	V. M. Bass, M. D.	Do.
Houston	*George W. Larendon, M. D.	Director of public health.
Laredo	H. M. Austin, M. D.	City health officer.
Lubbock	J. W. Rollo, M. D.	Do.
Marshall	W. H. Bennett, D. O., M. D.	City health officer and food inspector.
Palestine	J. M. Colley, M. D.	City health officer.
Pampa		
Paris	John A. Stephens, M. D.	Do.
Port Arthur	F. J. Beyt, M. D.	Do.
San Angelo	B. T. Brown, M. D.	Do.
San Antonio	*W. A. King, M. D.	Do.
San Benito	Neal D. Monger, M. D.	Do.
Sherman	C. D. Strother, M. D.	Do.
Sweetwater	*E. W. Prothro, M. D.	Director, city-county health unit.
Temple	Benjamin F. Lee, M. D.	City health officer.
Texarkana	Charles Adna Smith, M. D.	Do.
Tyler	Albert Woldert, Ph. G., M. D.	Do.
Waco	R. Wilson Crosthwait, M. D.	Do.
Wichita Falls	*Robert Bonner Wolford, M. D.	Do.
Utah.		
Ogden	Walter E. Whalen, M. D.	Director of health department.
Provo	Charles M. Smith, M. D.	City physician.
Salt Lake City	L. E. Viko, M. D.	Health commissioner.
Vermont:		
Barre	Michael F. Cerasoli, M. D.	Health officer.
Bennington	*Joseph M. Ayers	Do.
Burlington	Erald F. Foster, M. D.	City health officer.
Rutland	*Clare M. Cole	Health officer.
Virginia:		
Alexandria	*W. Lewis Schafer, M. D.	Health officer and clinician.
Charlottesville	*Edwin L. McQuade, M. D.	Health officer.
Danville	*R. W. Garnett, M. D.	Health officer and director of public welfare.
Hopewell	L. A. Sims	City engineer.
Lynchburg	*Mosby G. Perrow, Ph. D.	Director of public welfare.
Newport News	*G. Colbert Tyler, M. D.	Health officer.
Norfolk	J. C. Sleet, M. D.	Acting health officer.
Petersburg	Mason Romaine, M. D.	Health officer.
Portsmouth	*L. J. Roper, M. D.	Director of public welfare.

City	Name of health officer	Official title
Virginia—Continued.		
Richmond	*W. Brownley Foster, M. D	Director of public welfare and health officer.
Roanoke	*Coleman Bernard Ransone, M. D.	Health officer.
Staunton	J. F. Fulton, M. D.	Do.
Suffolk	*Challis Haddon Dawson, M. D.	Director of health.
Winchester	Lewis M. Allen, M. D.	Health officer.
Washington:		
Aberdeen	B. O. Swinehart, M. D	City health officer.
Bellingham	I. W. Powell, M. D	Do.
Bremerton	P. L. Sanders, M. D	Do.
Everett	I. W. Parsons, M. D	Do.
Hoquiam	John W. Stevenson, M. D	Do.
Longview	Justin S. McCarthy, M. D	Do.
Olympia	W. L. Bridgford, M. D	Do.
Port Angeles	Wm. H. Taylor, M. D	Do.
Seattle	*Frank M. Carroll, M. D	Commissioner of health.
Spokane	*Ralph Hendricks, M. D	Commissioner of public affairs and health officer.
Tacoma	Samuel M. Creswell, M. D	Director of health.
Vancouver	*Robert W. Armstrong, M. D	City-county health officer.
Walla Walla	*Jerry E. Vanderpool, M. D	Do.
Wenatchee	*Cecil Rhodes Fargher, M. D	County and city health officer and physician.
Yakima	*Lloyd Moffitt, M. D	City health officer.
West Virginia:		
Bluefield	*David B. Lepper, M. D., C. P. H	City health director.
Charleston	*Hugh B. Robins, M. D	Health commissioner.
Clarksburg	*John Edward Stephenson, M. D.	City health officer.
Fairmont	*J. A. Jamison, M. D	Do.
Huntington	*Gilbert A. Ratcliff, M. D	Director of public health and medical relief.
Martinsburg	*Edwin Cameron, M. D	Health officer.
Morgantown	*R. C. Farrier, M. D	City-county health officer.
Moundsville	*W. G. C. Hill, Ph. G. M. D.	Health director.
Parkersburg	*Arthur D. Knott, M. D., D. P. H.	City and county health officer.
Wheeling	*Reece M. Pedicord, M. D	City-county health commissioner.
Wisconsin.		
Appleton	Frank P. Dohearty, M. D	Health officer.
Ashland	C. O. Hertzman, M. D	Health commissioner.
Beloit	R. S. Vivian, M. D	Health officer.
Cudahy	Bernard Krueger, M. D	Do.
Eau Claire	L. H. Flynn, M. D	Do.
Fond du Lac	*Marshall O. Boudry, M. D	Health officer and city physician.
Green Bay	Henry S. Atkinson, M. D	City physician and health commissioner.
Janesville	Fred B. Welch, M. D.	City health officer.
Kenosha	*Gustave Windesheim, M. D	Director of health.
La Cross	*A. M. Murphy	Acting health commissioner.
Madison	*F. F. Bowman, B. L., M. D	Health officer.
Manitowoc	George M. Hoffman	Commissioner of health.
Marinette	J. William Boren, M. D	Health commissioner.
Milwaukee	*John P. Koehler, M. D	Commissioner of health.
	F. V. Brumbaugh, M. D	Deputy commissioner of health.
School hygiene division	*George P. Barth, M. D	Director.
Division of venereal diseases.	*William J. McKillip, M. D.	Do.
Vital statistics	*George E. Adams	Deputy register.
Division of tuberculosis	*George R. Ernst, M. D	Director.
Contagious disease division.	*Robert E. Hickey, M. D.	Do.
Division of food and sanitary inspection.	*Stanley Pilgrim, M. D. C	Do.
Bureau of laboratories	*R. W. Cunliffe	Do.
Division of child welfare	*E. V. Brumbaugh, M. D	Do.
Division of nurses	*Alma Brunk, R. N	Do.
Oshkosh	*Joseph John Kronzer, M. D	City physician and health commissioner.
Racine	*Ira F. Thompson, M. D., M. P. H	Commissioner of health.
Sheboygan	*G. J. Hildebrand, M. D	Commissioner of public health.
Shorewood	Jerome M. Jekel, M. D	Health commissioner.
South Milwaukee	Robert D. Moray, M. D	Do.
Stevens Point	Ferdinand R. Krembs, M. D	Health officer.
Superior	*P. G. McGill, M. D	Health commissioner.
Two Rivers	A. P. Zlatnik, M. D	Commissioner of health.
Watertown	Felix H. Zimmermann, M. D	Health commissioner.
Waukesha	Frank M. Scheele, M. D	Do.
Wausau	*Leigh F. Bugbee	Health officer.
Wauwatosa	E. F. Peterson, Ph. G., M. D	Health commissioner.
West Allis	*Charles S. Stern, M. D	Commissioner of health.
Wyoming:		
Casper	J. C. Kamp, M. D	City health officer.
Cheyenne	*Henry R. Dillman	City and county health officer.

DEATHS DURING WEEK ENDED APR. 20, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Apr. 20, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	8,842	8,766
Deaths per [illegible] basis	12.3	12.2
Deaths u[illegible]r 1 ye[illegible]	610	626
Deaths u[illegible]r 1 y[illegible]stimated live births	56	58
Deaths pe[illegible],000 [illegible]basis, first 16 weeks of year	12.6	12.6
Data from in[illegible]:		
Policies i[illegible]	67,781,169	67,712,710
Number [illegible]	12,189	14,007
Death cla[illegible]e, annual rate	9.4	10.8
Death cla[illegible]6 weeks of year, annual rate	10.7	11.1

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Apr. 27, 1935, and Apr. 28, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 27, 1935, and Apr. 28, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 27, 1935	Week ended Apr. 28, 1934	Week ended Apr. 27, 1935	Week ended Apr. 28, 1934	Week ended Apr. 27, 1935	Week ended Apr. 28, 1934	Week ended Apr. 27, 1935	Week ended Apr. 28, 1934
New England States:								
Maine		1	1		223	12	0	1
New Hampshire	1				3	194	0	0
Vermont					47	60	0	0
Massachusetts	5	12			495	2,105	3	3
Rhode Island					415	12	2	0
Connecticut	2	3	8		1,263	71	0	1
Middle Atlantic States:								
New York	23	52	[1] 5	[1] 10	2,927	965	26	2
New Jersey	17	12	17	23	2,110	728	3	1
Pennsylvania	67	68			5,631	4,301	5	4
East North Central States:								
Ohio	56	22	91	80	2,652	1,357	27	2
Indiana	8	17	21	13	403	973	4	0
Illinois	66	59	69	17	2,628	1,900	19	8
Michigan	11	12	2	2	5,698	258	4	0
Wisconsin	2	3	38	39	1,736	2,202	2	0
West North Central States:								
Minnesota	6	8			676	231	0	1
Iowa	9	10	4	8	275	174	3	6
Missouri	31	44	56	103	668	765	11	3
North Dakota	5	2	16		40	242	0	0
South Dakota		2			45	332	1	0
Nebraska	4	5		2	370	351	1	2
Kansas	7	3	12	8	1,209	684	1	0
South Atlantic States:								
Delaware		1	3		11	100	0	0
Maryland	3	4	9	12	85	2,338	9	0
District of Columbia	9	9	1		56	171	4	0
Virginia	16	15			584	1,310	5	0
West Virginia	11	16	54	15	393	77	1	1
North Carolina [3]	13	11	8	81	192	2,125	2	1
South Carolina	2	7	129	356	24	571	0	0
Georgia [3]	8	6				373	0	0
Florida [3]	4	5	2		74	932	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 27, 1935, and Apr. 28, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 27, 1935	Week ended Apr. 28, 1934	Week ended Apr. 27, 1935	Week ended Apr. 28, 1934	Week ended Apr. 27, 1935	Week ended Apr. 28, 1934	Week ended Apr. 27, 1935	Week ended Apr. 28, 1934
East South Central States								
Kentucky	10	11	4	31	468	711	10	0
Tennessee	11	4	59	25	23	514	6	1
Alabama [4]	15	13	58	43	541	669	6	3
Mississippi [1]	8	12					0	0
West South Central States:								
Arkansas	2	8	13	5	42	89	0	2
Louisiana [4]	23	16	7	9	58	302	0	0
Oklahoma [4]	10	6	60	47	115	420	2	1
Texas [4]	31	56	97	218	214	1,034	0	3
Mountain States:								
Montana [5]	2	1	23	75	426	58	2	1
Idaho [5]				1	11	32	1	0
Wyoming [5]	1	1			79	113	0	0
Colorado	7	3			538	449	0	1
New Mexico	4	7	1	3	32	159	0	1
Arizona	2		14	9	34	39	1	2
Utah [1 5]				2	2	216	0	0
Pacific States:								
Washington	3	2			550	167	4	0
Oregon [5]	5	1	28	26	310	86	1	0
California	29	44	42	26	1,606	751	8	1
Total	511	592	950	1,292	36,013	31,066	174	52
First 17 weeks of year	11,529	13,613	97,129	41,540	456,754	410,210	2,812	955

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 27, 1935	Week ended Apr. 28, 1934	Week ended Apr. 27, 1935	Week ended Apr. 28, 1934	Week ended Apr. 27, 1935	Week ended Apr. 28, 1934	Week ended Apr. 27, 1935	Week ended Apr. 28, 1934
New England States:								
Maine	1	0	11	9	0	0	2	2
New Hampshire	0	0	13	7	0	0	0	0
Vermont	0	0	14	5	0	0	0	37
Massachusetts	1	1	246	217	0	0	2	3
Rhode Island	0	0	13	26	0	0	0	0
Connecticut	0	0	76	58	0	0	0	0
Middle Atlantic States:								
New York	1	1	1,063	938	0	0	3	11
New Jersey	2	1	210	207	0	0	5	3
Pennsylvania	1	1	781	746	0	0	9	13
East North Central States:								
Ohio	0	0	823	866	0	0	5	3
Indiana	0	0	125	140	3	0	1	6
Illinois	1	1	1,313	568	0	3	8	4
Michigan	2	0	331	855	0	3	1	3
Wisconsin	0	0	381	193	24	31	1	0
West North Central States:								
Minnesota	0	0	424	52	2	8	0	2
Iowa	0	0	116	64	1	15	2	0
Missouri	2	0	60	86	2	2	7	3
North Dakota	0	0	84	19	0	0	2	3
South Dakota	0	0	19	3	1	5	0	0
Nebraska	0	0	83	44	35	15	1	0
Kansas	2	0	81	76	9	0	2	0
South Atlantic States:								
Delaware	0	0	10	7	0	0	0	0
Maryland	0	0	111	61	0	0	6	1
District of Columbia	0	0	64	11	0	0	1	0
Virginia	0	0	39	28	0	1	0	6
West Virginia	0	0	59	104	0	0	4	6
North Carolina [2]	3	0	20	31	1	3	0	2
South Carolina	0	0	2	9	0	3	0	6
Georgia [2]	0	0	1	4	1	1	7	9
Florida [2]	0	0	8	4	0	0	1	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 27, 1935, and Apr. 28, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 27, 1935	Week ended Apr. 28, 1934	Week ended Apr. 27, 1935	Week ended Apr. 28, 1934	Week ended Apr. 27, 1935	Week ended Apr. 28, 1934	Week ended Apr. 27, 1935	Week ended Apr. 28, 1934
East South Central States:								
Kentucky	0	1	39	46	0	0	14	8
Tennessee	0	0	24	11	1	1	2	13
Alabama [2]	2	0	5	3	0	2	5	7
Mississippi [3]	0	1	3	2	0	0	3	7
West South Central States:								
Arkansas	0	0		9	0	2	0	0
Louisiana [2]	1	0	11	15	2	6	15	18
Oklahoma [4]	0	0	13	9	0	6	2	8
Texas [2]	0	0	38	82	0	46	30	16
Mountain States:								
Montana [5]	0	0	6	18	19	0	1	2
Idaho [5]	0	0	4	1	0	0	0	0
Wyoming [5]	0	0	11	9	4	0	0	0
Colorado	0	0	176	16	2	1	0	1
New Mexico	0	0	24	12	3	0	0	3
Arizona	1	1	67	23	0	0	4	0
Utah [3 5]	0	0	153	4	0	0	0	0
Pacific States:								
Washington	0	1	49	33	32	15	2	5
Oregon [5]	0	0	43	27	4	13	0	0
California	3	11	151	212	4	2	5	7
Total	23	20	7,423	5,970	150	184	153	219
First 17 weeks of year	409	348	122,471	103,014	3,218	2,567	2,256	2,628

[1] New York City only.
[2] Typhus fever, week ended Apr. 27, 1935, 13 cases, as follows: North Carolina, 1; Georgia, 2; Florida, 1; Alabama, 1; Louisiana, 1, Texas, 7.
[3] Week ended earlier than Saturday
[4] Exclusive of Oklahoma City and Tulsa.
[5] Rocky Mountain spotted fever, week ended Apr. 27, 1935, 11 cases, as follows: Montana, 2; Idaho, 1; Wyoming, 2; Utah, 1, Oregon, 5.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
March 1935										
Alabama	15	53	2,477	201	2,142	41	1	54	4	11
Arizona	8	10	320	1	180	1	2	101	2	3
Idaho			31		353		0	153	1	3
Kansas	15	41	53		7,024		0	310	97	2
Louisiana	4	106	118	57	743	7	3	62	4	39
Mississippi	5	26	7,698	2,529	657	208	0	47	1	18
Missouri	65	175	1,201	25	4,257		1	428	30	11
Montana	3	26	557		1,041		0	52	29	2
New York	80	134		5	10,545		2	4,824	0	30
Oklahoma [1]	25	47	747	31	748	8	0	102	4	11
Rhode Island	5	1	1		408		0	65	0	1
Washington	4	34	139		969		1	241	74	9

[1] Exclusive of Oklahoma City and Tulsa.

March 1935

	Cases
Anthrax:	
Montana	1
New York	2
Chicken pox:	
Alabama	365
Arizona	118
Idaho	36
Kansas	410
Louisiana	49
Mississippi	845
Missouri	587
Montana	138
New York	4,036
Oklahoma [1]	186
Rhode Island	112
Washington	718
Dengue:	
Mississippi	12
Dysentery:	
Alabama (amoebic)	2
Arizona	9
Louisiana (amoebic)	7
Louisiana (bacillary)	1
Mississippi (amoebic)	35
Mississippi (bacillary)	209
Missouri	6
New York (amoebic)	2
New York (bacillary)	21
Oklahoma [1]	6
Washington (amoebic)	1
Epidemic encephalitis:	
Alabama	4
Montana	2
New York	13
Washington	4
German measles:	
Alabama	312
Arizona	79
Idaho	3
Kansas	6,000
Montana	2,703
New York	17,358
Rhode Island	12
Washington	1,623
Hookworm disease:	
Louisiana	4
Mississippi	310
Impetigo contagiosa:	
Montana	12

March 1935—Continued

	Cases
Mumps:	
Alabama	135
Arizona	108
Idaho	2
Kansas	804
Louisiana	5
Mississippi	910
Missouri	510
Montana	160
Oklahoma [1]	112
Rhode Island	68
Washington	580
Ophthalmia neonatorum:	
Louisiana	1
New York	6
Paratyphoid fever:	
Louisiana	1
New York	8
Washington	3
Puerperal septicemia:	
Mississippi	21
Rabies in animals:	
Alabama	114
Kansas	9
Louisiana	38
Mississippi	15
Missouri	12
New York [2]	1
Washington	4
Rabies in man:	
Oklahoma [1]	1
Rocky Mountain spotted fever:	
Idaho	4
Montana	5
Scabies:	
Montana	4
Oklahoma [1]	3
Septic sore throat:	
Idaho	1
Kansas	17
Louisiana	8
Missouri	123
Montana	18
New York	30
Oklahoma [1]	38
Rhode Island	5
Washington	6

March 1935—Continued

	Cases
Tetanus:	
Alabama	4
Louisiana	4
New York	5
Oklahoma [1]	1
Trachoma:	
Alabama	2
Arizona	23
Kansas	38
Mississippi	3
Missouri	61
Oklahoma [1]	8
Trichinosis:	
New York	16
Tularaemia:	
Alabama	3
Louisiana	3
New York	3
Typhus fever:	
Alabama	7
Louisiana	1
New York	2
Undulant fever:	
Alabama	4
Arizona	1
Kansas	2
Louisiana	1
Missouri	1
Montana	1
New York	13
Oklahoma [1]	1
Rhode Island	2
Vincent's infection:	
Kansas	6
Montana	2
New York [2]	69
Oklahoma [1]	2
Whooping cough:	
Alabama	247
Arizona	103
Idaho	83
Kansas	315
Louisiana	11
Mississippi	901
Missouri	201
Montana	163
New York	2,999
Oklahoma [1]	116
Rhode Island	43
Washington	113

[1] Exclusive of Oklahoma City and Tulsa.

[2] Exclusive of New York City.

PLAGUE-INFECTED GROUND SQUIRRELS IN MODOC COUNTY, CALIF.

The Director of Public Health of California reports that 7 ground squirrels from ranches 12 miles west and 5 miles south of Alturas, Modoc County, Calif., have been proved positive for plague. The squirrels were received at the laboratory between April 22 and 26, 1935.

WEEKLY REPORTS FROM CITIES

City reports for week ended April 20, 1935

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0		0	1	6	0	0	0	1	1	24
New Hampshire:											
Concord	0		0	0	2	3	0	0	0	0	9
Nashua	0			0		1	0		0	0	
Vermont:											
Barre	0			0		0	0		0	0	2
Burlington	1		0	35	0	1	0	0	0	0	11
Massachusetts:											
Boston	0		3	34	26	46	0	11	1	8	238
Fall River	0		0	2	4	4	0	1	0	4	28
Springfield	0		0	161	3	24	0	1	0	3	41
Worcester	0		1	2	10	11	0	2	0	2	52
Rhode Island:											
Pawtucket											
Providence	1		1	266	5	5	0	4	0	5	72
Connecticut:											
Bridgeport	0	1	1	6	3	17	0	1	0	3	28
Hartford	0		0	20	5	12	0	1	0	8	43
New Haven	0		0	449	1	0	0	1	0	2	49
New York:											
Buffalo	0		1	96	13	59	0	8	0	14	136
New York	23	9	7	1,549	174	727	0	96	1	220	1,063
Rochester	1		0	220	7	28	0	0	0	21	85
Syracuse	0		0	370	5	9	0	1	0	18	50
New Jersey:											
Camden	5		0	3	3	7	0	1	0	1	27
Newark	0	2	1	425	8	9	0	11	1	63	119
Trenton	0		0	6	2	11	0	4	0	2	41
Pennsylvania:											
Philadelphia	4	7	4	47	44	114	0	20	1	37	460
Pittsburgh	2	1	1	538	20	32	0	5	0	15	141
Reading	2		1	44	3	8	0	1	0	0	38
Scranton	0			54		1	0		0	1	
Ohio:											
Cincinnati	6		4	6	10	22	0	5	0	2	127
Cleveland	7	38	1	465	23	53	0	20	0	23	211
Columbus	3	5	5	182	5	31	0	5	1	2	91
Toledo	0	2	2	93	7	10	0	5	0	11	81
Indiana:											
Fort Wayne	2		0	12	2	1	0	0	0	2	31
Indianapolis	3		1	147	22	20	0	0	0	40	109
South Bend	0		0	4	7	4	0	0	0	0	21
Terre Haute	0			1		1	0		0	0	21
Illinois:											
Chicago	14	7	0	1,896	64	695	0	28	2	73	743
Springfield											
Michigan:											
Detroit	6	2	2	2,853	52	154	0	21	0	108	268
Flint	1		0	37	6	11	0	1	0	0	38
Grand Rapids	0		0	259	1	12	0	1	0	4	36
Wisconsin:											
Kenosha	0		0	67	1	18	0	0	0	1	5
Milwaukee	0	1	1	143	5	92	0	7	0	43	127
Racine	0		0	79	0	20	0	0	0	5	7
Superior	0		0	37	0	0	0	0	0	0	9
Minnesota:											
Duluth	0		0	185	1	1	0	0	0	1	20
Minneapolis	2		2	95	8	145	0	3	0	7	117
St. Paul	2	2	2	7	8	79	0	3	0	10	74
Iowa:											
Davenport	1			1		1	0		0	0	
Des Moines	0			326		4	0		0	1	38
Sioux City	0			4		1	0		0	2	
Waterloo	3			2		7	0		1	0	
Missouri:											
Kansas City	3		1	147	12	14	0	4	1	4	125
St. Joseph	1		0	3	2	1	0	2	0	3	19
St. Louis	27		0	17	8	21	0	6	1	10	183

City reports for week ended April 20, 1935—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
North Dakota											
Fargo	0		0	1	3	0	0	0	0	1	9
Grand Forks	0			0		0	0		0	0	- -
South Dakota											
Aberdeen	0			5		2	0		0	0	-
Sioux Falls	0			0		0	0		0	0	6
Nebraska											
Omaha			1	4	11	2	2	4	0	1	58
Kansas											
Topeka											
Wichita	0		0	[illegible]	3	4	0	1	0	10	31
Delaware											
Wilmington	0		0	11	4	2	0	1	0	0	22
Maryland											
Baltimore	[illegible]	3	0	[illegible]	23	66	0	20	1	27	229
Cumberland			0	3	1	[illegible]	0	0	0	0	19
Frederick	0		0	1	0	0	0	0	0	0	4
District of Columbia											
Washington	1	2	1	[illegible]	7	90	0	17	0	6	179
Virginia											
Lynchburg	0		0	10	2	1	0	0	0	18	12
Norfolk	1		0	35	7	0	0	4	0	5	47
Richmond	0		0	92	3	4	0	4	1	3	53
Roanoke	0		0	6	2	2	0	0	0	0	20
West Virginia											
Charleston	0		0	7	2	0	0	0	0	15	10
Huntington	0			3		2	0		0	0	
Wheeling	0		0	50	3	8	0	1	0	5	[illegible]
North Carolina											
Raleigh											
Wilmington	0		0	1	1	0	0	0	0	11	9
Winston-Salem	3	3	0	0	1	1	1	1	0	5	10
South Carolina											
Charleston	0	13	1	0	2	1	0	0	0	0	15
Columbia											
Greenville	1		0	1	2	0	0		0	3	10
Georgia											
Atlanta[1]	0	7	0	0	11	5	0	6	1	13	81
Brunswick	0		0	1	0	0	0	0	0	2	5
Savannah	0	[illegible]	1	0	4	1	0	2	0	1	37
Florida											
Miami	0	1		0		0	0		0	0	27
Tampa	0	1	1	34	5	0	0	1	2	1	28
Kentucky											
Ashland	0		0	9		0	0		0	0	-
Lexington	0		0	10	1	0	0	0	0	2	20
Louisville	2	1	0	253	13	14	0	3	0	12	[illegible]
Tennessee											
Memphis	1		0	0	[illegible]	6	0	1	0	0	75
Nashville	0		1	0	10	3	0	4	0	0	13
Alabama											
Birmingham	1	6	1	[illegible]	2	2	0	1	0	3	67
Mobile	0		0	6	0	1	0	2	0	0	23
Montgomery	0		0	13	0	0	0	0	0	0	0
Arkansas											
Fort Smith	0			0		0	0	-	0	0	---
Little Rock	0		0	62	6	1	0	2	0	11	8
Louisiana											
New Orleans	13	2	0	22	10	3	0	15	0	0	147
Shreveport	0		0	2	3	1	0	4	1	0	38
Texas											
Dallas	2	1	1		6	6	0	4	6	0	64
Fort Worth	2		0		5	3	0	3	0	5	35
Galveston	0		0	0	2	0	0	1	0	0	14
Houston	5		1	5	9	2	0	6	1	0	81
San Antonio	2		2	0	10	0	0	6	0	0	72
Montana											
Billings	1	-	0	3	0	0	0	0	0	0	8
Great Falls	0	--	0	- -	4	0	0	0	0	10	14
Helena	0		0	2	4	0	0	0	0	8	5
Missoula	0		0	125	0	0	0	0	0	8	0

[1] Instead of 11 cases of typhoid fever at Atlanta during the week ended Mar. 23 as published in the Public Health Reports for Apr. 12, 1935, p. 532, 11 cases of whooping cough should have been reported.

City reports for week ended April 20, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Idaho:											
Boise	0		0	2	0	0	0	0	0	0	6
Colorado:											
Denver	4	37	1	141	6	149	0	3	0	2	79
Pueblo	0		0	164	0	4	0	3	0	3	8
New Mexico:											
Albuquerque	0		0	27	1	1	0	2	0	4	5
Utah:											
Salt Lake City	3		1	4	4	130	0	1	0	111	33
Nevada:											
Reno	0		0	0	0	1	0	0	0	0	4
Washington:											
Seattle	0			143		12	2		0	5	
Spokane	0		0	121	6	7	1	0	0	0	35
Tacoma	0		0	5	2	2	0	0	0	0	33
Oregon:											
Portland	0		0	79	6	2	0	2	0	0	67
California:											
Los Angeles	8	27	0	53	18	35	2	26	1	13	359
Sacramento	1		0	92	2	17	0	2	1	0	24
San Francisco	1		1	26	6	24	0	6	0	7	147

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts:			
Fall River	1	0	0
New York:			
Buffalo	0	1	0
New York	20	8	0
New Jersey:			
Newark	1	0	0
Trenton	0	0	1
Pennsylvania:			
Philadelphia	2	0	0
Pittsburgh	1	1	0
Ohio:			
Cincinnati	5	2	0
Cleveland	2	0	0
Columbus	3	3	0
Toledo	1	0	0
Indiana:			
South Bend	1	0	0
Illinois:			
Chicago	15	3	0
Michigan:			
Detroit	1	1	1
Missouri:			
St. Louis	4	0	0
Nebraska:			
Omaha	0	1	0
Maryland:			
Baltimore	5	2	0
Cumberland	0	1	0
District of Columbia:			
Washington	5	3	0
Virginia:			
Lynchburg	1	0	0
South Carolina:			
Charleston	1	0	0
Kentucky:			
Louisville	2	0	0
Alabama:			
Birmingham	1	0	0
Colorado:			
Denver	0	1	0
Washington:			
Seattle	1	0	0
Spokane	1	0	0
Oregon:			
Portland	1	0	0
California:			
Los Angeles	1	1	1

Dengue.—Miami, 1 case.

Epidemic encephalitis.—Cases: New York, 1; Columbus, 2; Indianapolis, 1; Washington, 1; Atlanta, 1.

Pellagra.—Cases: Philadelphia, 1; Winston-Salem, 1; Atlanta, 1; Savannah, 5; Montgomery, 1; New Orleans, 1; Dallas, 2; San Francisco, 1.

FOREIGN AND INSULAR

CUBA

Habana—Communicable diseases—4 weeks ended April 13, 1935.—During the 4 weeks ended April 13, 1935, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	4	1	Tuberculosis	53	11
Malaria	[1] 10	4	Typhoid fever	[1] 11	
Scarlet fever	1				

[1] Includes imported cases.

IRISH FREE STATE

Vital statistics—Fourth quarter, 1934.—The following statistics for the Irish Free State for the quarter ended December 31, 1934, are taken from the Quarterly Return of Marriages, Births, and Deaths, issued by the Registrar General, and are provisional.

	Number	Rate per 1,000 population		Number	Rates per 1,000 population
Population	3,013,000		Deaths from:		
Marriages	[illegible]	1.60	Dysentery	1	
Births	[illegible]	18.10	Influenza	100	0.13
Total deaths	[illegible]	12.90	Measles	16	
Deaths under 1 year	[illegible]	([1])	Puerperal sepsis	14	1.03
Deaths from:			Scarlet fever	11	
Cancer	[illegible]	1.0[illegible]	Tuberculosis (all forms)	[illegible]	1.00
Diarrhea and enteritis (under 2 years)	11		Typhoid fever	19	-
Diphtheria	[illegible]		Whooping cough	19	-

[1] Deaths under 1 year per 1,000 births: [illegible] per 1,000 births.

ITALY

Communicable diseases—4 weeks ended January 6, 1935.—During the 4 weeks ended January 6, 1935, cases of certain communicable diseases were reported in Italy, as follows:

Disease	Dec. 10–16, 1934		Dec. 17–23, 1934		Dec. 24–30, 1934		Dec. 31, 1934–Jan. 6, 1935	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	23	20	10	10	14	14	15	14
Cerebrospinal meningitis	7	6	8	8	2	2	10	10
Chicken pox	519	168	623	171	353	105	410	122
Diphtheria and croup	770	394	814	397	602	303	603	326
Dysentery	8	7	8	5	7	5	4	3
Lethargic encephalitis	4	4	--	--	3	3	2	2
Measles	2,423	303	2,389	320	1,810	266	2,150	300
Poliomyelitis	13	12	6	6	5	5	6	4
Scarlet fever	505	192	440	179	277	132	352	129
Typhoid fever	460	290	465	256	336	200	309	203

JAMAICA

Communicable diseases—4 weeks ended April 20, 1935. During the 4 weeks ended April 20, 1935, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis	1		Leprosy		2
Chicken pox	20	17	Puerperal fever		3
Dysentery	2	1	Tuberculosis	39	68
Erysipelas	1	1	Typhoid fever	10	36

PUERTO RICO

Notifiable diseases—4 weeks ended April 20, 1935.—During the 4 weeks ended April 20, 1935, certain notifiable diseases were reported in Puerto Rico, as follows:

Disease	Cases	Disease	Cases
Chicken pox	170	Ophthalmia neonatorum	5
Diphtheria	35	Pellagra	1
Dysentery	13	Puerperal fever	1
Erysipelas	2	Ringworm	1
Filariasis	2	Syphilis	37
Framboesia	2	Tetanus	4
Influenza	27	Trachoma	1
Malaria	826	Tuberculosis	1, 103
Measles	164	Typhoid fever	24
Mumps	89	Whooping cough	174

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Apr. 26, 1935, pp. 580-594. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued May 31, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

India (French)—Chandernagor.—During the week ended March 30, 1935, 16 cases of cholera with 7 deaths were reported at Chandernagor, French India.

Plague

Hawaii Territory—Maui Island—Makawao District—Kahului.—A rat found dead April 23, 1935, 10 miles from the port of Kahului, Makawao District, Maui Island, Hawaii Territory, has been proved plague infected.

Indo-China—Tanghai Island.—On April 12, 1935, 12 cases of plague were reported at Tanghai Island, Indo-China.

Typhus fever

Iraq—Sulaimani liwa.—On April 23, 1935, 18 cases of typhus fever were reported at Sulaimani liwa, Iraq.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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THE DESTRUCTION OF MOSQUITOES IN AIRPLANES

A Preliminary Note

By C. L. Williams, *Senior Surgeon*, and W. C. Dreessen, *Passed Assistant Surgeon, United States Public Health Service*

For some years the quarantine officials of the world have been concerned over the problem of restricting the spread of yellow fever by means of airplane travel. One important feature of this problem is the prevention of transfer of infected *Aëdes aegypti*.

TRANSFER OF MOSQUITOES

It has been proved by Griffitts [1] that the transfer of mosquitoes by airplane actually occurs. It has been shown that if mosquitoes are placed in airplanes, at least a proportion of them will still be found therein many hours later, although the airplane had flown in the interim some hundreds of miles. Furthermore, a careful search of airplanes has resulted in occasionally finding mosquitoes, including *Aëdes*, that have found their way into the planes at some point along the route.

PROBLEMS OF FUMIGATION

With the finding of mosquitoes (particularly *Aëdes aegypti*) in airplanes demonstrated, it becomes important to devise adequate means of destroying them. At first glance this would appear to be relatively simple, considering the fumigants at present available and the susceptibility of this insect to destruction by fumigation. On closer examination, however, the problem becomes complicated, because of the necessity of applying fumigation at different points. For example, an airplane leaving Rio de Janeiro and stopping at Pernambuco, Port of Spain, San Juan, Port au Prince, Habana, and Miami should be fumigated between each of these stops. Furthermore, fumigation should not be delayed until the arrival of the

[1] Griffitts, T. H. D., and Griffitts, J. J.: Mosquitoes transported by airplanes. Pub. Health Rep., vol. 46, no. 47, Nov. 20, 1931, pp. 2775–2782.

airplane, since during its stay mosquitoes might readily leave before the airplane can be fumigated.

To meet the conditions enumerated, fumigation might be performed at the port of departure and at each port of call immediately before the airplane departs, thereby destroying any mosquitoes taken on at each port; or the airplane might be fumigated while in flight between ports. Both of these conditions present the difficulty that, to some extent at least, the passengers would have to be fumigated along with the mosquitoes.

CHOICE OF FUMIGANT

The apparent necessity for fumigating the passengers along with the mosquitoes eliminates consideration of the most effective fumigants, particularly hydrocyanic acid. Even though the fumigant may be very rapidly cleared from an airplane, the tendency of hydrocyanic acid to become absorbed in upholstery appears to render its use inadvisable for this type of fumigation. The use of HCN during flight, of course, is out of the question.

The thought of carrying out fumigation while the airplane is in flight is an attractive one; obviously, that is the point where fumigation can be applied to the very best advantage. In addition to the passenger fumigation problem, however, the matter of additional weight is presented; the fumigant and the apparatus to apply it cannot be heavy—not more than a very few pounds at the most—without imposing on the carriers a very considerable economic burden.

With these considerations in view, the efforts of the past few months have been directed both toward the utilization of a fumigant relatively harmless to human beings that can be applied while the airplane is at a port of call, and to the development of a fumigant innocuous to human beings that can be carried in small bulk, applied by light machinery, and utilized while the airplane is in flight. The possibilities of the development of the last-named type of fumigant were suggested by the observation that airplanes in which a pyrethrum extract insecticide was sprayed during flight were regularly found free from living mosquitoes on arrival at United States ports.

RANGE OF EXPERIMENTS TO DATE

So far, experimental work has been carried out to a limited extent with carboxide and with concentrated pyrethrum extract.

CARBOXIDE EXPERIMENTS

Carboxide is composed of 1 part ethylene oxide mixed with 9 parts carbon dioxide, packed under high pressure in steel cylinders. It is applied by attaching a pressure hose to the cylinder, leading the hose

into the space to be fumigated, opening the valve wide, and permitting the desired amount of the fumigant to flow out under its own pressure. The amount of gas used is determined by placing the cylinder on scales and noting progressive loss of weight. Carboxide is generally packed in cylinders containing 30 pounds of the fumigant, the cylinder itself weighing something over 40 pounds. It will be noticed at once that the weight of the fumigant and container practically precludes its being carried by the airplane for fumigation during flight.

Ethylene oxide, which is the active ingredient in carboxide, is not dangerous to fumigators handling it during the ordinary course of fumigation in which the fumigators are exposed to the gas for only short periods, and then usually not to high concentrations. It has been shown, however, that when human beings are exposed to this gas for considerable periods or to high concentrations, it is not without effect upon them. Its effect has been tested upon guinea pigs, in which animal it was shown that irritation of the respiratory tract, including the lungs, occurred.

From these considerations it will be seen that the use of carboxide as a fumigant during flight is precluded, but that it might be used for fumigation on the ground followed by rapid ventilation of the airplane immediately before departure.

Experiments to determine the lethal dose of carboxide for *Aedes aegypti* were carried out during the latter half of 1934 at the New Orleans quarantine station. In these experiments, mosquitoes bred in a colony maintained at the station were exposed to varying concentrations of the gas for varying periods. Briefly, the technique was to capture mosquitoes from the breeding cage by drawing them (by air suction) into a glass tube closed by a wad of cotton, against which the mosquitoes were held. From this tube they were blown into small mosquito netting cages. These cages were placed in a small, carefully sealed room into which the carboxide was blown; the mosquitoes were exposed for the period of the test and then removed to the open air or into a room free from gas. Observations continued for a total period of 1 week following fumigation.

Results are probably best given by citing typical experiments.

Experiment no. 1. - August 29, 1934. 20 *Aèdes aegypti* were exposed for one-half hour to carboxide in a concentration of 10 ounces per 1,000 cubic feet. Result: All mosquitoes alive and active.

Experiment no 2.—August 29, 1934. 30 *Aëdes aegypti* were exposed for 2 hours to 12½ ounces of carboxide per 1,000 cubic feet. Result: Mosquitoes somewhat sluggish when removed from fumigation; next day, all alive.

Experiment no. 3.—September 4, 1934. 37 *Aëdes aegypti* were exposed for one-half hour to 3¼ pounds of carboxide per 1,000 cubic feet. Result: Immediately on removal, 1 mosquito was apparently

dead; the next morning, 3 were dead, others alive; at the end of the week, 30 were dead, 7 still alive.

Experiment no. 4.—September 5, 1934 23 *Aedes aegypti* were exposed for 1 hour to 6 pounds of carboxide per 1,000 cubic feet. Result: Immediately after removal, 1 mosquito was apparently dead; the next morning, all but 3 were dead; the day following, all were dead.

Experiment no. 6.—September 7, 1934. 23 *Aedes aegypti* were exposed for one-half hour to 13¼ pounds of carboxide per 1,000 cubic feet Result: Immediately on removal, all were alive, the next morning, 4 were still alive, others dead; on the second day, 3 were still alive in the morning, but by afternoon all were dead.

Experiment no. 8.- October 2, 1934. 30 *Aedes aegypti* were exposed for one-half hour to 12 pounds of carboxide per 1,000 cubic feet. Result: Immediately on removal, 7 were apparently dead; the following day, 16 were dead in the morning, and by evening 23 were noted as dead; the second day, only 6 were still alive; the third day, 3 were still alive, the same number being alive on the fourth day; on the fifth day, 2 were alive, both of which died on the sixth day.

Experiment no. 9.—October 22, 1934. 72 *Aedes aegypti* were exposed for one-half hour to 15 pounds of carboxide per 1,000 cubic feet. Result: Immediately on removal, 2 were noted as dead; the next day, 68 were dead, leaving 4 alive; the following day, 3 were alive; on the third day, 2 were alive, but were noted as quite weak; on the fourth day, 1 was alive, and this one was found dead on the fifth day.

Experiment no. 12.—October 23, 1934. 64 *Aedes aegypti* were exposed for one-half hour to 20 pounds of carboxide per 1,000 cubic feet. Result: Immediately on removal from the gas, 7 were noted as dead; 2 hours later, all were dead.

INTERPRETATION OF CARBOXIDE EXPERIMENTS

From the experiments cited, the interpretation is inescapable that mosquitoes (*Aedes aegypti*) are surprisingly resistant to carboxide. This was quite unexpected, since it is well known that mosquitoes are usually more susceptible to fumigating gases than are most other insect pests. It will be noted that, with one-half hour exposure, the concentration of carboxide necessary to produce death within 24 hours is between 15 and 20 pounds per 1,000 cubic feet of air space.

Exposures longer than one-half hour were ruled out of consideration for practical purposes, since rapid action is essential for utilization in fumigation of airplanes; as a matter of fact, one-half hour is considered far too long a period if it can be at all avoided.

It has been concluded from these experiments that carboxide is not suitable for the destruction of mosquitoes in airplanes.

PYRETHRUM EXTRACT EXPERIMENTS

Pyrethrum extracts have been on the market for years in the form of insecticidal sprays. As a rule, these sprays are made up by diluting a concentrated extract in oil with highly refined kerosene, the dilution generally being such that every 100 cc contains one-tenth gram of pyrethrins.

Since the principal killing agent in these sprays is the pyrethrin, and since the weight of the fumigating material constitutes an essential consideration in the fumigation of airplanes in flight, it appeared to us that there was little use in testing these commercial type insecticide sprays but that it would be much better to work with the concentrated extract from which they were generally manufactured. The one actually selected is an extract, in light oil, of which 1 gallon contains the pyrethrins from 20 pounds of standardized pyrethrum flowers. The flowers are assayed and mixed by the manufacturers so that each 100 cc of the extract contains 2 grams of pyrethrins.

There is available an extract of twice the strength of that just described. It is expected that, in future work, this will be tested.

The method of experiment was to blow the pyrethrum extract into a closed room in the form of a very fine spray, practically a mist. In the first 5 experiments, the amounts were only approximately measured, but thereafter the dosage was accurately determined by weighing the extract container before and after spraying.

Immediately after spraying the extract into the room, two cages of test mosquitoes were placed therein. The room was sealed during the period of exposure. When it was opened, one of the test cages was removed, and it was then closed for an additional exposure period, at the end of which time the second test cage was removed. The mosquitoes thereafter were kept under observation for 24 hours.

All of the results reported herein are based on 24 hours' observation after fumigation. Further observation of the mosquitoes in these tests showed that when 3 grams per 1,000 cubic feet or more of the extract was used, all of the mosquitoes died within 2 or 3 days. Results beyond the 24-hour observation period, however, are not recorded, because it has not as yet been possible to determine definitely whether these fumigated *Aëdes* would attempt to bite before dying. A number of tests of their biting ability after fumigation have been made, all of them negative; but they are too few in number as yet to form the basis of any definite statement.

The results of the 25 experiments with pyrethrum extract that have been performed to date are given in table 1.

TABLE 1.—*Results of 25 experiments with pyrethrum extract*

Experiment no.	Amounts of pyrethrum extract used			Time of exposure	Percent killed in 24 hours	Number of Aëdes	
	Grams per 1,000 cubic feet	Cubic centimeters per 1,000 cubic feet	Ounces (approximately) per 1,000 cubic feet			Total	Female
1	(1)	(1)	5	½ hour	100	40	(1)
2	(1)	(1)	5	½ hour	[2] 100	[2] 50	(1)
				1 hour	100	50	(1)
3	(1)	(1)	2½	15 minutes	100	37	(1)
				½ hour	100	30	(1)
4	(1)	(1)	1½	15 minutes	100	75	31
				½ hour	100	46	22
5	(1)	(1)	½	15 minutes	97	33	14
				½ hour	100	32	16
6	53.0	64.0	2.1	10 minutes	100	42	15
				15 minutes	100	63	41
7	169.5	207.0	6.07	5 minutes	100	44	15
				10 minutes	100	34	14
8	10.0	12.2	⅓	5 minutes	100	31	16
				10 minutes	100	31	18
9	11.5	14.0	.45	5 minutes	100	31	11
				10 minutes	100	20	0
10	15.5	18.9	.6	5 minutes	100	36	15
				10 minutes	100	35	19
11	6.5	7.9	¼	5 minutes	100	39	22
				10 minutes	98	46	28
12	3.3	4.0	⅛	5 minutes	91	47	28
				10 minutes	95	37	25
13	3.4	4.1	⅛	5 minutes	100	30	32
				10 minutes	100	53	24
14	3.9	4.7	1/7	5 minutes	97	67	45
				10 minutes	100	34	18
15	2.5	3.0	1/10	5 minutes	100	52	28
				10 minutes	100	66	23
16	1.07	2.4	1/13	5 minutes	98	47	23
				10 minutes	96	52	31
17	1.11	1.4	1/25	5 minutes	96	51	32
				10 minutes	98	59	39
18	1.04	1.3	1/25	5 minutes	21	63	26
				10 minutes	52	62	38
19	1.25	1.5	1/20	5 minutes	100	50	21
				10 minutes	100	47	13
20	.88	1.1	1/30	5 minutes	66	50	36
				10 minutes	94	65	28
21	2.6	3.2	1/10	5 minutes	93	28	8
				10 minutes	84	88	35
22	1.8	2.2	1/14	5 minutes	99	87	43
				10 minutes	90	84	44
23	1.95	2.4	1/13	5 minutes	95	63	37
				10 minutes	92	73	42
24	2.47	3.0	1/10	5 minutes	98	58	21
				10 minutes	100	83	40
25	2.86	3.5	1/6	5 minutes	100	36	15
				10 minutes	100	34	17

[1] Not accurately measured or counted.
[2] Top figure in each experiment indicates cage given shortest exposure.

INTERPRETATION OF RESULTS

It will be noted in the table that the first 5 experiments are distinctly preliminary. The amount of material used was only approximately determined, and the periods of exposure were relatively long. Having discovered through them, however, that we had an effective fumigating material, the exposures were reduced to 5 and 10 minutes and the amount of material used was progressively made smaller and smaller. Experiments 6, 7, 8, 9, and 10 showed that when 10 or more grams per 1,000 cubic feet were used, with exposures of 5 and 10 minutes, a uniformly 100-percent kill in 24 hours occurred. In experiment 11,

6.5 grams per 1,000 cubic feet produced a 100-percent kill in 5 minutes, though only 98 percent in 10 minutes' exposure. In experiments 12, 13, 14, 15, 21, 24, and 25, in which from 2.5 to 3.9 grams per 1,000 cubic feet were used, the kill was 90 percent or better, with the single exception of 1 portion of experiment 21, where only an 84-percent kill was secured. In 3 of these experiments, numbers 13, 15, and 25, the kill was 100 percent in both sections of the experiment, the amounts used being, respectively, 3.4 grams, 2.5 grams, and 2.86 grams per 1,000 cubic feet.

In experiments 16, 17, 18, 19, 20, 22, and 23, less than 2 grams per 1,000 cubic feet were used; the proportionate kill, however, was better than 90 percent in the majority of these experiments. In one of them, experiment 18, the poor results are believed to have been due to faulty spraying, it being noticed at the time that the spray was much heavier than in other experiments and that a material amount of it was deposited on the floor. In one experiment, number 19, 1.25 grams per 1,000 cubic feet were used, with a kill of 100 percent in both cages. This was the only experiment utilizing less than 2 grams, however, that showed a 100-percent result.

It would appear from these experiments that the minimum dosage of this pyrethrum extract required to kill *Aèdes aegypti* within 24 hours after exposure lies somewhere between 2 and 4 grams per 1,000 cubic feet.

It will be seen throughout these experiments that 5 minutes' exposure produced practically as good results as 10 minutes' exposure.

CONDITIONS OF EXPERIMENTS

The conditions under which mosquitoes were secured for the experiments with pyrethrum extract differed somewhat from those already described. In these, the mosquitoes were bred under control conditions, the larvae being grown in bowls outside of the cages, and the pupae separated and placed in test tubes as soon as they appeared. The test cages were all filled with freshly hatched imagos that appeared in the tubes in which the pupae had been placed. In practically all of the experiments, therefore, mosquitoes between 1 and 3 days old were used. While test cages were in process of being filled, the mosquitoes therein were fed with sugar water.

The test cages used were made of mosquito netting, were cubical in shape, and varied from 6 to 15 inches in each dimension. It is probable that, to a certain extent, the walls of these cages reduced the effectiveness of the insecticide spray by absorbing a portion of it as it passed through them. This point will be checked in later work by fumigating mosquitoes released in the compartment into which the spray is introduced.

Most of these experiments were carried out during the winter months, so that atmospheric conditions were necessarily artificial. The great majority of the experiments were performed in the same building in which the mosquito colony was maintained, which building was kept at a temperature of between 75° and 85° F. Humidity sufficient to prevent material loss in the colony was maintained by hanging wet blankets in the room, placing pans of water on the radiators, and keeping a pot of water over an electric hotplate. The relative humidity, however, was not determined.

It is expected that the results reported will be checked during the summer months under outside atmospheric conditions, which, in the climate of New Orleans, are favorable to the propagation and maintenance of *Aedes aegypti*.

The mosquito colony was subject to frequent check by examination of individuals and by examination of the mosquitoes used in these experiments. It was maintained throughout as a pure colony of *Aëdes aegypti*.

MAINTENANCE OF THE MOSQUITO COLONY

Briefly, the colony of *Aëdes aegypti* was maintained by inoculating and maintaining breeding in 5 wire-mesh cages, cubical in shape, and approximately 3 to 4 feet on a side. In some of the cages the mosquitoes were permitted to lay eggs on damp sponges, which were taken out, allowed to stand for a day or so, and then placed in water to permit the eggs to hatch. In others, small cypress water-troughs were placed, these proving attractive locations for the deposit of eggs; the eggs appeared just above the water-line; and, as the water evaporated, more and more space for them became available. At the end of 10 days, the troughs were removed and water was added, filling them to the brim, when the eggs in the troughs promptly hatched.

All larvae were transferred to china bowls and fed on small amounts of brewer's yeast. When the pupae appeared, they were removed with a large-mouthed medicine dropper to test tubes containing water. When the pupae hatched, the imagos were in part returned to the breeding cages and in part used for experiments.

Mosquitoes in the cages fed on clipped rabbits every 2 days; in the interim they were allowed to feed on sugar water absorbed in cotton sponges.

It was found necessary to place the supporting legs of the cages in pans of water covered with kerosene oil to prevent ants from carrying away the mosquito eggs, while daily careful searches of the cages were required to eliminate small house spiders, which were the principal enemies of the adult mosquitoes.

TENTATIVE CONCLUSIONS

1. Carboxide is not a suitable fumigant to kill mosquitoes in airplanes, either in flight or on the ground, because the containers are too heavy and the amount of material necessary to kill an effective percentage of *Aedes aegypti* is too large.

2. A concentrated oil extract of pyrethrum flowers containing 2 grams of pyrethrins per 100 cc is highly effective against *Aëdes aegypti* when brought in contact with them in the form of a very fine spray, the lethal concentration apparently being somewhere between 2 and 4 grams per 1,000 cubic feet.

3. Mosquitoes fumigated with either carboxide or pyrethrum extract do not die at once. It must remain for future experimentation to determine whether they are rendered incapable of biting before dying.

4. The small amount of concentrated pyrethrum extract required to kill mosquitoes should render this material suitable for the destruction of these mosquitoes on airplanes in flight.

5. It is the general belief that neither the pyrethrins nor the oil in which they are dissolved is harmful to human beings.

STUDIES OF SEWAGE PURIFICATION

II. A ZOOGLEA-FORMING BACTERIUM ISOLATED FROM ACTIVATED SLUDGE

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BRIEF REVIEW OF THE LITERATURE

Research studies on the activated sludge process conducted by the Stream Pollution Investigations Laboratory of the United States Public Health Service during the past 2 years, under the direction of Sanitary Engineer J. K. Hoskins, have indicated that zoogleal material is regularly present in large amounts in activated sludge flocs. Each time that an activated sludge has been developed during this study, regardless of whether it was in a small laboratory set-up or in a tank of plant-size proportions, the floc developed has contained a very considerable amount of zooglea. When the process was working most efficiently, zoogleal masses predominated in the sludge. These findings, which are in general accord with the observations made by previous workers, point to the very probable importance of this type of organism and suggest an intensive study of the zoogleal bacteria found in activated sludge to determine their characteristics and the efficiency of any sludge produced by them under pure culture conditions.

The earliest report found, that referred to zoogleal bacteria, was the book of Flügge (1886) on micro-organisms. Kruse, who wrote a chapter in this text, mentions zoogleal bacteria and states that Itzigsohn, in 1867, was the first to observe zoogleal formations. Itzigsohn designated the specimen studied by him as *Zooglea ramigera*. Kruse states further that Zopf considers this *Zooglea ramigera* to be one phase in the life cycle of Cladothrix.

Winogradsky (1892) noted that the nitrite-forming bacteria existed both in the motile and in the zoogleal stage. He believed that the zoogleal form probably represented a resting stage. This observation in regard to a resting stage may be true in the case of nitrifying bacteria, but our results would indicate that, under the conditions of our experiments, or in activated sludge, the zoogleal stage, while immotile, is a very active phase in terms of the utilization of food material. This observation of Winogradsky on the development of a zoogleal stage by the nitrifying bacteria would seem to suggest definitely that this type of zoogleal mass may adsorb unoxidized ammonia compounds just as the zooglea reported later in this paper removed other oxidizable material from solution. Indeed, it is not unreasonable to assume that a number of bacteria of this type which produce sludges of various adsorptive properties may be located within this group, and efforts to isolate and study such organisms are indicated.

Flügge (1896), discussing the development of zooglea, believes that the zoogleal matrix is a massed exhibition of capsular substance. He states that a given zoogleal mass is generally entirely composed of the same type of cell, suggesting a pure culture. He finds that in polluted water the growth of zoogleal masses is rapid; that both spherical zooglea and a branched tree-like form, called *Zooglea ramigera*, are very common. His illustration (fig. 13) of this tree-like form is quite similar to the specimen shown in our figure 2. Unfortunately, no further characteristics of the organism are given. He credits Kruse with having originally assigned the name of *Zooglea ramigera* to this type of growth.

Stützer and Hartleb (1897), in their series of papers on the saltpeter fungi, give a limited description of *Zooglea ramigera*. They describe it as forming spores, oxidizing nitrogen compounds, and as manifesting exceedingly variable morphological characters, including a coccoid, rod, and fungus-like stage, as well as the zoogleal formation. In addition, they found that, in the latter stages of growth, this organism would reduce both the nitrites and the nitrates which had been formed. These marked variations, together with their definite disagreement with the researches of Winogradsky on the nitrifying bacteria, whose findings have since been fully substantiated, leads one to question the purity of the cultures employed by them.

Some uncertainty appears to exist as to whether the gelatinous matrix of the zoogleal mass has been synthesized by the bacteria or whether the bacteria are simply embedded in a chemically preformed matrix. Zooglea-forming bacteria have been investigated by various workers in studies of gum formation. Thus, in his work on *Rhizobium radicicolum*, Buchanan (1909) found that this organism produced a gum and existed in part as a zoogleal mass. In discussing this he states: "It seems but fair to conclude from this array of evidence that there is a great possibility that bacterial slimes and gums of whatever kind are produced as a transformation or solution of the bacterial capsule." Again, Buchanan (1922) defines zooglea as bacteria growing in masses of gelatinous material secreted by the bacterial cells and shows two figures demonstrating the individual bacteria.

Waksman (1927), in discussing this group of organisms, states: "The gum is formed with various sources of energy in the medium, such as cane sugar, glycerol, or legume extract, and should be considered as a synthesized product."

Lohnis (1921), writing of zoogleal bacteria in general, indicates that large encysted agglomerations of bacterial cells are not at all uncommon and implies further that the term zooglea has been so generally and so loosely used for all slimy agglomerations of bacteria that it has lost its original specific meaning.

Theories regarding the role of the bacteria in sewage purification processes have varied from the opinion that they are essential to the process, no purification being accomplished without their activity, to the view that their presence is entirely unnecessary, the purification observed being an illustration of chemical catalysis.

Johnson (1914) was apparently the first observer to emphasize the importance of the bacteria in the activated sludge process. Writing of sewage filters, he states: "The filter material rapidly becomes coated with a slimy or gelatinous growth of *Zooglea ramigera*, which may be regarded as a large number of bacteria embedded in a gelatinous matrix. This zooglea is perhaps the most characteristic and important organism of this zone." Again, referring on this occasion to activated sludge, he suggests that microscopically activated sludge repeatedly contained Opercularia and zooglea. He believes that the zooglea assisted by the protozoa are responsible for the rapid purification accomplished.

Buswell and Lang (1923) presented results on the microbiology of activated sludge and advanced a theory concerning the process. Since then, Buswell (1928, 1931) has made extensive observations on the gross biology of activated sludge and he is convinced that

the zoogleal bacteria, *Zooglea ramigera*, and the protozoa are of primary importance in activated sludge. The pure culture studies necessary to establish this relationship and to determine the cultural characteristics were not made. In 1928, after presenting the results of his own studies and reviewing the literature on the subject, Buswell, in summarizing, suggests the following statement as the theory of the activated sludge process: "Activated sludge flocs are composed of a synthetic gelatinous matrix similar to that of Nostoc, or Merismopedia, in which filamentous and unicellular bacteria are embedded and on which various protozoa and some metazoa crawl and feed. The purification is accomplished by ingestion and assimilation by organisms of the organic matter in the sewage and its resynthesis into living material of the flocs. This process changes organic matter from colloidal and dissolved states of dispersion to a state in which it will settle out."

As food material, before it can be assimilated and used for energy or be synthesized into protoplasm, must pass through the bacterial cell wall, the extent of bacterial surface available is an all important factor in studying the purification accomplished by bacteria. Buswell calculates that, considered on the basis of the zoogleal masses alone, each cubic foot of the aeration chamber contains at least 250 square feet of such surface. If the surface of the free-swimming bacteria and of the protozoa were included, he believes that approximately 500 square feet of surface would be provided per cubic foot of aeration chamber.

Taylor (1930) concurs with Buswell's theory and states: "A close examination under high powers of the microscope reveals that the bulk of the sludge is composed of jelly-like masses, in which bacteria are present in large numbers. This is a typical zooglea formation, caused by the fusion of the gelatinous sheaths surrounding the bacterial cells. This zooglea is apparently the only growth in activated sludge which is a constant factor. The usual form of the zooglea is that of an irregular, lobed mass, but at times a branching, or filamentous form predominates."

Many other writers have commented on zoogleal growths in sewage purification processes without offering any specific data regarding the characteristics of these bacteria or the sludges produced by them in pure culture. Bergey (1934), in his Manual of Determinative Bacteriology, does not list *Zooglea ramigera* or any bacterium with definite zoogleal characteristics. This omission is due probably to the paucity of definite evidence for the differentiation of this type of organism. Intensive effort has been directed, therefore, to the isolation and study of zoogleal bacteria from activated sludge.

METHODS OF PRESENT STUDY

Initial efforts to isolate the zooglea-forming bacteria were made by picking colonies from routine standard agar plates made from activated sludge. These colonies were transferred to nutrient broth, incubated with and without aeration and studied to determine the presence of zooglea formation. No such growths were obtained although hundreds of colonies were picked and examined.

Solid media containing gelatin in the place of agar were also tried without success. A special sludge agar was then prepared in which the distilled water ordinarily employed in the preparation of media was replaced with fresh sewage-activated sludge mixtures. It was thought that this would supply the plating media with all of the ingredients found in the sludge where the zoogleal bacteria were known to grow well. However, although large numbers of colonies were picked and studied, no zooglea-forming bacteria were obtained.

Effort was then directed to the purification of clumps of zooglea prior to planting to render the sample suitable for examination in liquid media. Selected typical zoogleal formations, such as those in the unstained preparation from normal activated sludge, illustrated in the photomicrograph in figure 1, were picked out with sterile capillary-tipped pipettes and transferred in series through dilution waters in an attempt to wash them free from extraneous bacteria and foreign matter. This method had been successfully employed previously for the isolation of plankton. A zoogleal mass illustrating both the fingered and the solid type of formation produced by this organism, washed fairly free from extraneous material, is shown in the photomicrograph in figure 2.

In carrying out this cleansing procedure an unexpected phenomenon was encountered. During the course of the washing, the embedded bacterial cells would free themselves from the gelatinous matrix and move away with incredible speed, dispersing throughout the dilution water, long before a satisfactory washing had been accomplished. Such a dispersal of embedded cells is shown in figure 3. In this photomicrograph the faint outline of the zoogleal matrix may be seen with cells scattered without as well as within its limits. In figure 4, such a gelatinous zoogleal matrix, which has been fixed with a mordant and stained, may be clearly observed. Observations made subsequently appeared to suggest that the embedded bacteria feed on nutrient material adsorbed by the gelatinous matrix and then, when it is cleared of such material by repeated washing, they leave the matrix possibly in an effort to find sufficient food.

It was found that this dispersing action could be prevented by the addition of a considerable amount of dissolved organic material to the wash water. Ten cc of sterile nutrient broth added to 90 cc of dilution water proved to be satisfactory for this purpose. Using such a water a zoogleal mass could be washed through 10 to 12 changes of water until it was entirely clear of extraneous material and apparently free from contaminating bacteria. The clump was transferred at this time to normal dilution water and changes in such water continued until dispersion of the cells occurred. This suspension was then placed in a measured amount of sterile dilution water and planted on standard agar plates and in serial dilutions in standard lactose broth.

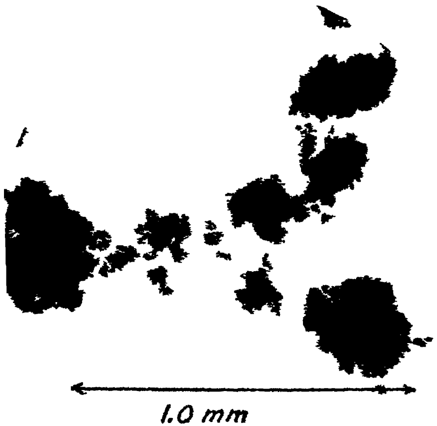
No colonies containing zooglea-forming bacteria were obtained from the agar plates. In fact, only a few colonies of any kind were observed and they were confined to the 1-cc and the 0.1-cc plates made from the original suspensions. Growths of zooglea-forming bacteria were obtained from all broth tubes up to and including the 1-to-100,000 dilution from tubes incubated at both 20° and 37° C. The growths obtained appeared to be in pure culture in all tubes above the 1-to-100 dilution. This process was repeated several times and plantings were made in each case from the highest dilution showing growth, with intermediate washing in dilution water, to insure the purity of the culture before intensive studies were undertaken. The photomicrograph shown in figure 5 portrays a typical growth taken from one of these broth cultures. The granular nature of this floc is clearly illustrated in the figure. In figure 6 a portion of the floc found in the left center section of figure 5 is shown under higher magnification. Here the bacterial nature of the floc can also be observed. This culture was designated as Z–1.

A second isolation, using the same procedure, was made from a normal activated sludge produced in another series of experiments. The organism isolated at this time was apparently identical in all respects with the bacterium obtained from the first isolation. This culture was designated as Z–3.

After experimental results, reported later in this paper, had shown that this zoogleal bacterium was probably of especial significance in sewage purification and in the activated sludge process in particular, a detailed study was made of the conditions favoring the growth of this organism and of its characteristics.

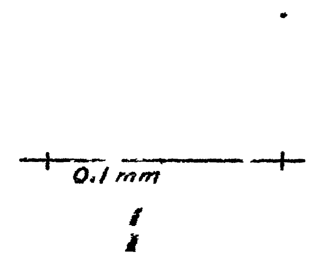
CHARACTERISTICS OF THE ZOOGLEA-FORMING BACTERIUM

Morphological.—This organism is rod-shaped, average length 3 microns, varying from 2 to 4, average diameter 1.5 microns, varying from 1 to 2, with definitely rounded ends. In liquid media it shows a marked tendency to grow in a floc or zoogleal mass manifested as a loosely bound floc, as a dense spherical mass, as an evenly lobed mass,

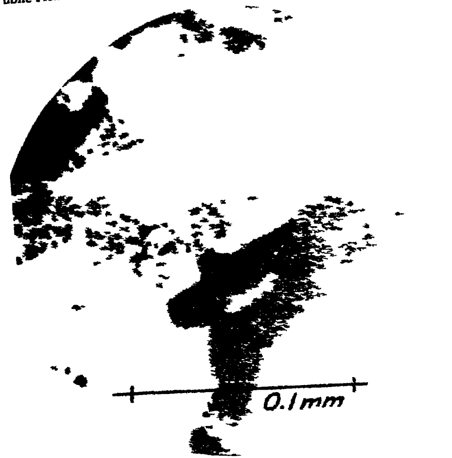


GURE 1 — Activated slu l e showing flc s with typical zoc le l f rm ti ns (unst une)

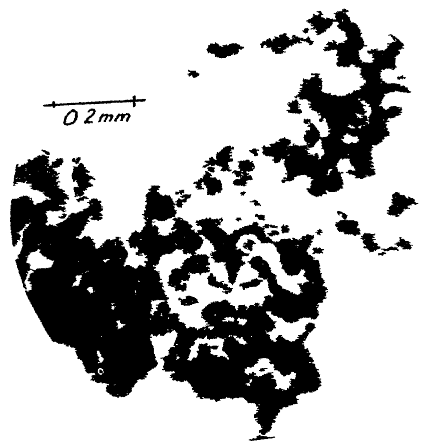
FI URE 2 Zoo leal ma s from normal activat l l l e fl \ a hed an l teased free from nonzoogleal materi l un taine l



FIGUR 3 — I utially disp e c l zoo leal mas sho ng bacteri both without an l with m tl e n iti \ 1 staine



…URE 4—Zoogleal m… …stained … … …
…ith … In the central mass, … …
…cteri… … … …



…—Zoogleal … from pure culture … broth
… … lower

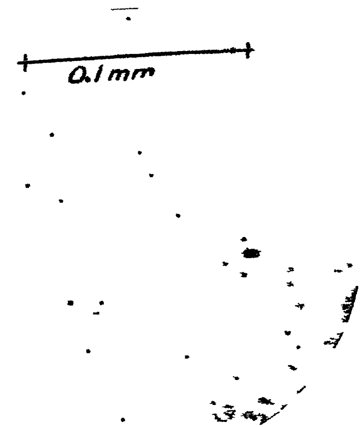
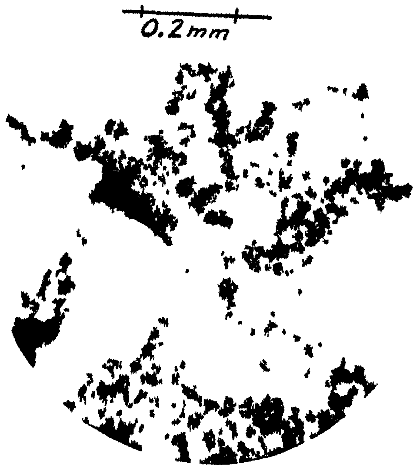
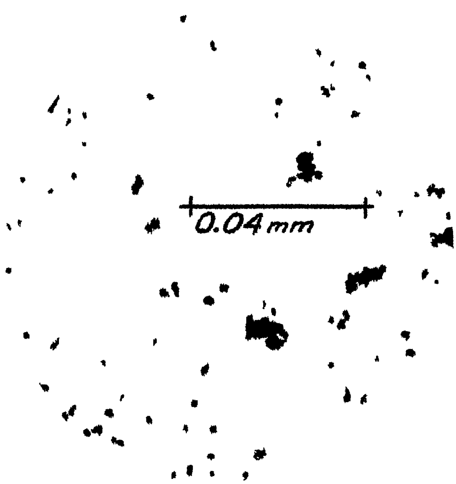


FIGURE 6—Zoogleal mass from pure culture in broth … …
… Tip of floc … … …



Fi ttt A t v ud l l t l t v t gc l l v z o l ul l ud mmpu c illm n stenliz t sc v t



Fi ttt —Zoo kal bacteria Flagella stain of fluid smear

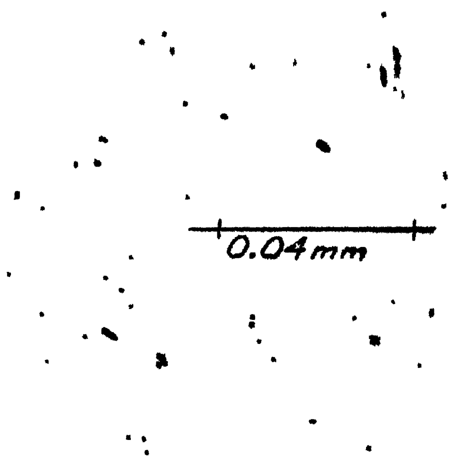


FIGURE 9.—Zoogleal bacteria. Flagella stain of thin smear

or as a fingered treelike floc. When found outside the mass it usually occurs singly, occasionally in pairs, or in fours joined end to end. Capsules were always observed when stained by the method of Anthony (1931). The capsular wall was from 1 to 1½ times as thick as the bacterium. Spores are not produced, as none have been observed microscopically and no growth was ever obtained after application of the heat test. When not embedded in a zoogleal mass, individual organisms are very actively motile. Chains of 2 to 4 are motile but not as active as individual cells. The bacterium possesses a single polar flagellum about 5 to 6 microns long. This character, as demonstrated by the staining method of Gray (1926), is shown in figures 8 and 9. Although the usual variation in the size of cells was noted, irregular or involution forms were not found in the cultures examined. The organism was not observed to retain Gram's stain at any stage of culture.

Cultural.—No growth of this organism has been obtained at any time on standard agar or gelatin. Scanty growth was obtained on a special sludge agar and a moderate growth on nutrient agar containing 10 percent ascites fluid. It grows well at both 20° and 37° C. in nutrient broths containing peptone, producing a flocculent growth with an abundant sediment which is flocculent to granular. As a rule, the broth without the flocs remains clear and is free from odor. Broth with an initial pH of 7.0 to 7.2 has invariably become more alkaline as growth progresses, until in 5 days at 37° and in 10 days at 20° a pH of 8.2 to 8.4 is reached. It grows luxuriantly in sterilized sewage under aeration, producing a flocculent sludge which settles rapidly when the agitation is stopped. The alkalinity of such sewage is increased by this growth until a pH of 8 6 to 8.8 is reached.

Physiological.—A slow growth of this organism has been observed at temperatures as low as 4° C. Most vigorous multiplication occurs between 20° and 37° C., with the optimum temperature approximately at 28° to 30°. Growth takes place over a pH range of 5.6 to 8.5. However, the rate of growth at the lower figure is very slow until the pH has been raised by the products of growth. The optimum pH appears to be at about 7.0 to 7.4. No evidence of pigment production has been noted. Indole is not produced in either peptone or tryptophane broth. These tests for indole were made at 2 and 10 days, using the technique of both Bohme (1905) and of Goré (1921). Hydrogen sulphide was not produced. The organism is a strict aerobe, failing to grow, during a 10-day incubation period, in vacuo or when the oxygen of the air has been replaced by nitrogen. The organisms subjected to such anaerobic conditions for 7 days were not killed, however; for when half of the cultures were removed and placed under aerobic conditions, growth occurred within 24 hours. Tests were made on the ability of this organism to ferment glucose, levulose, lactose, sucrose, maltose, mannite, innulin, and xylose when present in

standard broth and in peptone-free synthetic media. No growth was observed in the synthetic media. Good growth occurred in the presence of each of these sugars in nutrient broth. No gas was produced in any instance; and, as evidenced by changes in the hydrogen-ion concentration, no acid was produced from any of these sugars. However, acid may have been produced and neutralized by the byproducts of growth; for, as has been noted previously, this organism produces alkali in nutrient broth until a pH of about 8.3 is reached, while in these sugar broths a pH of 7.7 was the maximum reached in all cases after 10 days.

The survey made of the literature has not revealed a definite description of an organism with the characteristics of this zoogleal bacterium. However, regardless of the fact that this organism may manifest a growth formation of dispersed single cells, of loosely bound flocs, or of dense spherical and lobed masses, depending on various factors, the peculiar branched treelike form of zoogleal growth assigned to *Zooglea ramigera* by Flügge, together with the illustration given by him, is most unusual and is, under certain conditions, a characteristic of the organism described here. While such limited information as this is too meager to warrant any attempt at the classification of an organism with ordinary characteristics, it is believed that, in the case of this bacterium with this peculiarly shaped colonial form in liquid media, this one characteristic is almost sufficient for identification. For this reason this zoogleal organism, which has now been somewhat more fully described, is tentatively assumed to be a variety of the *Zooglea ramigera*, named by earlier workers, until further studies may confirm or disprove this belief.

EXPERIMENTAL RESULTS

With synthetic media.—Experiments were instituted now with this zoogleal organism Z-1 to determine (*a*) whether it would produce a sludge under conditions of activation and (*b*) the properties of such sludges if any were produced. These tests were carried out under aseptic conditions and with reproducible synthetic media to eliminate as many variables as possible. Dilute standard lactose broth prepared by diluting 6 cc of broth to 100 cc with dilution water was used as synthetic media. Such media have a 5-day biochemical oxygen demand of about 300 parts per million, simulating in this respect a fairly strong domestic sewage. Sterilization by autoclave was carried out in containers, put up with the necessary air-filters and appliances to provide for continuous aeration under pure culture conditions.

Preliminary trials made with this set-up disclosed that a good sludge floc was formed under conditions of very moderate aeration, but when air was applied at a normal rate the floc tended to break up and become dispersed. This, in connection with the observed make-

up of normal activated sludge flocs, appeared to indicate the need for some inert foreign substances to act as a binder or framework for the floc. A number of substances were considered for this purpose. Very short cotton fibers and asbestos fibers were selected for trial because of their inert character Initial tests with these materials showed that the zoogleal bacteria would develop rather tenacious flocs adherent to cotton fibers, but they would not adhere to asbestos fibers under any of the conditions tried.

The aeration apparatus was then set up with the synthetic media prepared with the addition of about 0.2 gram of short cotton fibers per liter of media. It was inoculated with the zoogleal organism and aerated continuously. After 48 hours a definite floc formation was observed. Thereafter, during the course of these tests this floc was allowed to settle for 30 minutes twice daily. At each settling two-thirds of the contents were siphoned off as supernatant and were replaced with a like amount of the original media. This process was continued until a sludge of 2,000 parts per million or over, measured in terms of suspended matter, had been developed. This sludge settled rapidly with a sludge index of 15 to 20 (15 to 20 percent of the sewage-sludge mixture) at the end of 30 minutes' settling.

Tests were then made on the capacity of this sludge to remove oxidizable material from solution. This observation was made by taking first a sample of the supernatant for a biochemical oxygen demand determination, immediately after fresh media had been added and thoroughly mixed. The mixture was then aerated for a 3-hour interval and a sample of supernatant was removed for a second biochemical oxygen demand determination. The difference between these two oxygen demand results should represent any changes which had occurred in the supernatant during the 3-hour aeration period. That is, if any oxidizable material had been removed from the supernatant by aeration of the media with the sludge, the oxygen demand of the second sample should be correspondingly reduced. To avoid the errors of unbalanced biological activity, which are frequently encountered when sterile or pure culture samples are put up for oxygen demand determinations, these samples were heavily seeded with a grossly mixed culture of bacteria and plankton. Each pair of samples was seeded with the same mixed culture and to the same extent.

Five such tests were completed with this experimental set-up. The amount of oxidizable material removed during the 3-hour aeration interval, as indicated by the biochemical oxygen demand determination, was, for the five tests, as follows: 75, 76, 66, 68, and 73 percent, respectively.

Control experiments using the same synthetic media containing cotton fibers, with nonzoogleal bacteria present and without bacteria,

were carried on at the same time and under the same conditions. No sludges were developed either with or without bacterial growth. The cotton fibers under these conditions did not settle materially during a 30-minute period. In the series with bacteria, *Bact aerogenes* was introduced and other bacteria from the air gained entrance. A very marked bacterial growth developed. However, oxygen demand determinations on samples collected before and after a 3-hour aeration period, after fresh media had been added as in the test series, did not in any instance show that any appreciable amount of oxidizable material had been removed. In fact, the removal indicated did not exceed 5 percent in any test.

The results show definitely that, under the conditions of these tests, the activated sludge formed by this zoogleal organism is a potent factor in the removal of oxidizable material from solution, removing an average of 72 percent during a 3-hour period. This is very greatly in excess of the amount that could be oxidized during such an interval by the usual biochemical process.

With sterilized sewage.—The tests described above, conducted with synthetic preparations, are subject to the criticism that the media did not correspond to sewage and that the zoogleal sludge formed may have been peculiarly adapted to adsorb ingredients of the synthetic media. To meet such criticism and more closely to simulate the conditions in a sewage plant, in the following-described tests a change was made from synthetic media to natural sewage.

To maintain pure culture conditions which are essential if the results obtained are to be ascribed solely to the activity of the zoogleal bacteria, it was necessary to sterilize the sewage prior to use. Sterilization by chemical means was not suitable, as any substance which would adequately sterilize the sewage could not be removed completely. Sterilization by filtration was not satisfactory; for not only would the sewage be materially altered by such filtration, but also it would be impossible to state positively that all biological elements had been eliminated. Sterilization by heat was adopted, therefore, as the most satisfactory procedure. Catch samples of domestic sewage were collected from day to day and autoclaved for the media in the tests made. The strength of this sewage varied greatly, but a large enough sample was collected each time so that all units of a series, including the controls, could be started or dosed with identical media. This autoclaving of the sewage consistently shifted the hydrogen-ion concentration from about pH 7.2 to about pH 9.0. Before use, the sterilized sewage was always adjusted to pH 7.0 with sterile 1 : 10 phosphoric acid.

Using such sterilized sewage as media in 8-liter amounts and sterile apparatus designed to permit aeration under aseptic conditions, 4

sludges were developed. A good floc simulating activated sludge began to appear after 48 hours' aeration. Thereafter, during the course of the tests, 5 liters of supernatant, after 30 minutes' settling, were removed daily (with the exception of Sundays) and a like amount of sterile sewage was added. After about 2 weeks a sludge of 2,000 parts per million which settled rapidly with indices between 15 and 20, had developed. Biochemical oxygen demand tests to determine the amount of oxidizable material removed from the supernatant during a 3-hour aeration interval after additional sterile sewage had been added were made in each case. The results showed that 68, 76, 66, and 64 percent (average 68 percent), respectively, of the oxidizable material in the supernatant had been removed.

In one container of this series, after the tests had been completed the mixture was divided into two parts, maintaining pure culture conditions, and an inoculation of a bacteria-free protozoa culture, Colpidium, was made into one of them. Both parts, thereafter, were treated in the same manner and the supernatant was replaced with fresh, sterile sewage daily until the Colpidium had reached their maximum number. Oxygen demand tests were then made on the supernatant before and after a 3-hour aeration period. The tests showed that the percentage of oxidizable material removed by the zooglea plus Colpidium mixture was only slightly greater than that obtained with the zooglea-only sludge. However, the supernatant from the aeration vessel containing the zooglea plus Colpidium was much clearer. Microscopical examinations showed that the majority of the free-swimming bacterial cells and the zooglea of microscopic proportions had been cleared from this effluent.

These observations with sterilized sewage as test media were repeated. In this set-up zoogleal cultures Z–1 and Z–3 were both used. A separate container was employed for each culture. A sludge of good appearance had developed in each after 3 days' aeration. Thereafter, 5,000 cc (out of 8,000 cc total) of supernatant were withdrawn daily and replaced with sterile sewage. After 10 days sufficient sludge had developed to begin observations. A photomicrograph of this sludge is shown in figure 7. In this series, suspended solids and oxygen demand observations were made on all samples collected both before and after the 3-hour aeration period. Occasional observations were also made on the nitrite and nitrate content of the aeration mixtures. No material change in the amounts of either of these substances present was observed. This would suggest that this organism did not oxidize ammonia to nitrites or nitrites to nitrates. The results of this series of tests are presented in table 1.

TABLE 1.—*Data concerning activated sludges developed by zooglea cultures Z–1 and Z–3*

Culture	Suspended solids, parts per million, sample collected—		Changes during 3-hour aeration period	
	Before aeration	After aeration	In suspended solids	In percent oxidizable material removed from supernatant
Z–1	1,600	1,800	+200	69
Z–1	[1] 4,100	3,776	−324	41
Z–1	6,512	7,032	+520	71
Z–3	1,810	2,333	+523	57
Z–3	2,248	2,520	+272	68
Z–3	4,528	4,712	+184	56

[1] A large dense particle of debris was observed in this crucible after the weighing had been made.

After these tests had been completed, a mixture of Z–1 and Z–3 sludge was divided into two parts. One was inoculated with Colpidium and both were continued in regular operation until the Colpidium had reached a number of 53,000 per cc. A test was then made to determine the amount of oxidizable material removed during a 3-hour aeration interval. In this instance the zooglea plus Colpidium sludge was more effective, removing 84 percent while the zooglea alone removed 65. It was again observed that the supernatant from the Colpidium-containing mixture was much clearer.

The results given in table 1 indicate again that a large amount of the oxidizable material in the added sewage is removed by the zoogleal sludge during a 3-hour aeration period. In addition it is noted that, in 5 out of 6 of the suspended solids tests made in this series, the weight of the sludge in terms of suspended matter materially increased during the 3-hour aeration interval, indicating an adsorption of dissolved and perhaps of colloidal material.

In connection with these experiments with sterilized sewage as media, control tests were run with sterile sewage under aseptic conditions and with sterilized sewage inoculated with *Bact. aerogenes* and treated in the same manner as those inoculated with zooglea. Oxygen demand observations before and after a 3-hour aeration period were made on these control experiments only after the sewage had been under aeration for a number of days and the *Bact. aerogenes* had developed fully. The results of these control tests showed that no oxidizable material was removed during a 3-hour period either in the sterile container or in the vessel containing *Bact. aerogenes*. In one instance a 7-percent increase in oxidizable material was observed, and in another a 5-percent decrease. These amounts are well within the limits of error for an individual determination of this type.

SUMMARY

Zoogleal masses have been observed in every good activated sludge examined. This conforms with earlier reports in the literature.

A zooglea-forming bacterium has been isolated in pure culture from activated sludge.

This bacterium in pure culture, both in synthetic media and in sterilized sewage has produced a floc which simulated activated sludge.

This pure culture floc has been shown to remove, during a 3-hour aeration period, from 41 to 84 percent of the oxidizable material present in polluted water.

The morphological, cultural, and physiological characteristics of this bacterium are given in detail.

This organism is tentatively identified as a variety of *Zooglea ramigera* as described by earlier workers.

It is suggested that an adequate knowledge of this and related organisms may be of considerable significance in sewage purification processes depending on biological activity.

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DEATHS DURING WEEK ENDED APRIL 27, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Apr. 27, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	9,017	8,609
Deaths per 1,000 population, annual basis	12.6	12.0
Deaths under 1 year of age	607	645
Deaths under 1 year of age per 1,000 estimated live births	56	60
Deaths per 1,000 population, annual basis, first 17 weeks of year	12.6	12.6
Data from industrial insurance companies.		
Policies in force	67,826,175	67,729,876
Number of death claims	14,265	13,953
Death claims per 1,000 policies in force, annual rate	11.0	10.7
Death claims per 1,000 policies, first 17 weeks of year, annual rate	10.7	11.1

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended May 4, 1935 and May 5, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 4, 1935, and May 5, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 4, 1935	Week ended May 5, 1934	Week ended May 4, 1935	Week ended May 5, 1934	Week ended May 4, 1935	Week ended May 5, 1934	Week ended May 4, 1935	Week ended May 5, 1934
New England States:								
Maine	2	1	3		176	31	0	0
New Hampshire	1		1			157	0	0
Vermont					41	62	0	0
Massachusetts	8	12			427	1,425	4	1
Rhode Island					518	17	1	0
Connecticut	2	3	5	1	1,493	126	0	0
Middle Atlantic States:								
New York	23	48	[1] 3	[1] 12	3,149	1,220	24	5
New Jersey	26	15	16	18	1,908	731	5	2
Pennsylvania	36	58			4,283	3,306	9	5
East North Central States:								
Ohio	16	26	6	6	1,808	1,559	6	7
Indiana	11	13	34	14	467	1,367	7	1
Illinois	47	31	26	51	2,322	2,418	29	13
Michigan	15	15	2	3	6,587	281	2	0
Wisconsin	3	2	32	33	1,727	2,030	1	1
West North Central States:								
Minnesota	7	8	1	2	597	302	2	1
Iowa	5	6	91	2	665	186	5	0
Missouri	20	35	31	49	528	608	14	0
North Dakota	2	5	5	2	30	165	1	0
South Dakota	4	3	2		67	425	0	0
Nebraska	5	11	2		373	369	2	2
Kansas	14	11	15	2	1,136	635	1	4
South Atlantic States:								
Delaware	1	4			4	108	0	0
Maryland [2]	8	2	4	4	77	2,597	9	0
District of Columbia	7	3		2	60	97	9	0
Virginia	13	7			509	1,139	7	6
West Virginia	10	20	35		390	97	11	0
North Carolina	12	12	21	25	341	2,174	0	2
South Carolina	2	8	142	324	29	443	0	0
Georgia [2]	2	6				252	0	0
Florida	4	4	5		28	911	0	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 4, 1935, and May 5, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 4, 1935	Week ended May 5, 1934	Week ended May 4, 1935	Week ended May 5, 1934	Week ended May 4, 1935	Week ended May 5, 1934	Week ended May 4, 1935	Week ended May 5, 1934
East South Central States:								
Kentucky	10	11	9	8	450	509	0	2
Tennessee	13	9	35	47	41	526	7	3
Alabama	19	5	35	66	175	703	1	3
Mississippi [2]	5	8					0	1
West South Central States:								
Arkansas	2	9	16	9	60	38	3	2
Louisiana	19	22	1	5	70	196	0	0
Oklahoma [4]	1	3	60	42	104	310	0	6
Texas [3]	34	52	146	228	68	852	1	3
Mountain States:								
Montana [5]	6	5	41	40	445	108	1	0
Idaho		1			6	33	0	0
Wyoming [5]	2				27	130	0	0
Colorado [5]	5	9			247	691	1	0
New Mexico	6	4		1	31	180	0	0
Arizona	1		10	4	20	76	0	0
Utah [2]	1	1			7	166	0	0
Pacific States:								
Washington	2	2			439	240	3	0
Oregon [3]	4	3	22	19	264	79	2	0
California	25	44	48	49	1,595	930	7	1
Total	470	557	905	1,068	33,879	31,055	175	72
First 18 weeks of year	11,999	14,170	98,034	42,608	490,633	471,265	2,487	1,027

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 4, 1935	Week ended May 5, 1934	Week ended May 4, 1935	Week ended May 5, 1934	Week ended May 4, 1935	Week ended May 5, 1934	Week ended May 4, 1935	Week ended May 5, 1934
New England States:								
Maine	0	0	5	11	0	0	0	0
New Hampshire	0	0	23	8	0	0	0	0
Vermont	0	0	9	2	1	0	0	17
Massachusetts	1	1	210	217	0	0	4	1
Rhode Island	0	0	9	20	0	0	1	1
Connecticut	1	0	90	60	0	0	1	1
Middle Atlantic States:								
New York	0	4	961	768	0	0	3	7
New Jersey	0	0	164	177	0	0	3	8
Pennsylvania	0	0	590	642	0	0	8	9
East North Central States:								
Ohio	0	0	731	820	0	1	3	6
Indiana	0	0	131	159	0	5	0	7
Illinois	1	1	1,269	575	0	4	4	4
Michigan	1	1	331	672	1	1	5	8
Wisconsin	0	0	427	187	16	28	0	3
West North Central States:								
Minnesota	2	0	413	57	5	12	0	0
Iowa	0	0	91	75	0	11	0	0
Missouri	1	0	64	87	0	4	0	8
North Dakota	0	0	126	21	0	0	0	0
South Dakota	0	1	13	13	11	3	0	1
Nebraska	0	0	57	35	35	9	1	0
Kansas	0	0	75	43	36	5	3	8
South Atlantic States:								
Delaware	0	0	5	4	0	0	1	1
Maryland [2]	1	1	123	52	0	0	1	9
District of Columbia	0	0	78	10	0	0	0	0
Virginia	1	0	36	34	0	0	5	7

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 4, 1935, and May 5, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 4, 1935	Week ended May 5, 1934	Week ended May 4, 1935	Week ended May 5, 1934	Week ended May 4, 1935	Week ended May 5, 1934	Week ended May 4, 1935	Week ended May 5, 1934
South Atlantic States—Continued								
West Virginia	0	0	64	77	0	1	5	5
North Carolina	2	1	9	19	0	3	4	2
South Carolina	0	0	7	5	2	0	4	3
Georgia [1]	0	1	-------	2	0	0	11	4
Florida	0	0	4	3	0	0	5	3
East South Central States:								
Kentucky	0	0	33	57	1	0	15	8
Tennessee	1	0	19	29	0	0	2	7
Alabama	0	0	6	8	0	0	3	6
Mississippi [2]	0	1	7	7	0	0	5	1
West South Central States:								
Arkansas	1	1	2	7	2	1	2	7
Louisiana	2	0	17	11	0	0	15	18
Oklahoma [4]	0	0	13	15	3	3	6	3
Texas [3]	0	2	39	62	7	27	5	18
Mountain States:								
Montana [5]	0	0	10	10	4	2	0	1
Idaho	0	3	4	3	0	0	0	2
Wyoming [5]	0	0	37	11	17	1	0	0
Colorado [5]	0	0	251	27	5	5	0	0
New Mexico	1	0	10	12	6	0	6	4
Arizona	0	2	51	10	0	0	1	0
Utah [2]	0	0	129	10	0	0	0	1
Pacific States:								
Washington	2	0	61	49	57	8	1	5
Oregon [5]	0	1	-------	42	9	2	1	2
California	3	13	199	201	21	11	4	5
Total	21	34	7,003	5,426	239	147	138	201
First 18 weeks of year	430	382	129,474	108,440	3,457	2,714	2,394	2,829

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended May 4, 1935, 7 cases, as follows: Georgia, 4; Texas, 3.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Rocky Mountain spotted fever, week ended May 4, 1935, 9 cases, as follows: Montana, 3; Wyoming, 2; Colorado, 2; Oregon, 2.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
March 1935										
Nevada	3	-------	16	-------	41	-------	0	20	0	0
Puerto Rico	-------	62	63	846	163	-------	1	-------	0	44
Virginia	23	77	2,417	4	5,527	10	1	273	1	9
April 1935										
Connecticut	3	17	28	-------	6,402	-------	1	473	0	1
Delaware	-------	2	3	-------	56	-------	0	54	0	0
Missouri	36	143	403	26	3,324	-------	2	297	8	16

March 1935

	Cases
Chicken pox:	
Nevada	96
Puerto Rico	159
Virginia	529
Diarrhea and dysentery:	
Virginia	66
Dysentery:	
Puerto Rico	25
Virginia (amoebic)	2
Filariasis:	
Puerto Rico	1
Leprosy:	
Puerto Rico	1
Mumps:	
Nevada	1
Puerto Rico	90
Virginia	412
Ophthalmia neonatorum:	
Puerto Rico	10
Virginia	1
Puerperal septicemia:	
Puerto Rico	6
Rocky Mountain Spotted fever:	
Nevada	1
Septic sore throat:	
Nevada	1
Virginia	5
Tetanus:	
Puerto Rico	9
Virginia	1

March 1935—Continued

	Cases
Tetanus, infantile:	
Puerto Rico	4
Trachoma:	
Puerto Rico	1
Virginia	1
Tularaemia:	
Virginia	1
Undulant fever:	
Virginia	5
Whooping cough:	
Nevada	56
Puerto Rico	352
Virginia	451

April 1935

	Cases
Chicken pox:	
Connecticut	558
Delaware	39
Missouri	309
Conjunctivitis:	
Connecticut	25
Dysentery:	
Connecticut (amoebic)	1
Missouri	11
Epidemic encephalitis:	
Missouri	1
German measles:	
Connecticut	677
Delaware	2

April 1935—Continued

	Cases
Lead poisoning:	
Connecticut	1
Mumps:	
Connecticut	322
Delaware	54
Missouri	475
Ophthalmia neonatorum:	
Connecticut	1
Missouri	1
Rabies in animals:	
Connecticut	7
Missouri	15
Septic sore throat:	
Connecticut	38
Missouri	61
Tetanus:	
Connecticut	2
Trachoma:	
Missouri	3
Trichinosis:	
Connecticut	2
Undulant fever:	
Connecticut	5
Missouri	6
Whooping cough:	
Connecticut	212
Delaware	7
Missouri	266

WEEKLY REPORTS FROM CITIES

City reports for week ended Apr. 27, 1935

This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria, cases	Influenza		Measles, cases	Pneumonia, deaths	Scarlet fever, cases	Smallpox, cases	Tuberculosis, deaths	Typhoid fever, cases	Whooping cough, cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0		0	1	7	0	0	0	0	0	25
New Hampshire:											
Concord	1		2	0	1	1	0	0	0	0	13
Nashua	0			0		0	0		0	0	
Vermont:											
Barre	0		0	1	1	1	0	1	0	4	3
Burlington	0			16		4	0		0	0	6
Massachusetts:											
Boston	0		1	41	10	42	0	10	0	18	257
Fall River	0		0	5	2	11	0	3	0	5	26
Springfield	0		0	113	5	13	0	4	0	5	49
Worcester	0		0	4	12	18	0	3	1	9	58
Rhode Island:											
Pawtucket	0		0	2	0	0	0	0	0	0	16
Providence	0		0	288	9	7	0	4	0	2	60
Connecticut:											
Bridgeport	0		0	6	6	13	0	0	0	2	37
Hartford	1		0	35	5	10	0	0	0	12	50
New Haven	0		0	481	1	2	0	0	0	0	47
New York:											
Buffalo	1		1	50	15	62	0	5	0	28	152
New York	20	5	5	1,585	160	641	0	106	0	208	1,653
Rochester	0		0	210	6	25	0	0	0	16	78
Syracuse	0		0	458	2	13	0	1	0	15	42
New Jersey:											
Camden	1		0	1	2	17	0	0	0	3	33
Newark	1	4	1	646	11	7	0	7	0	55	103
Trenton	0		0	7	3	11	0	3	0	0	44
Pennsylvania:											
Philadelphia	4	11	5	66	47	122	0	39	0	87	590
Pittsburgh	0	3	1	510	29	52	0	11	0	17	191
Reading	1		0	84	2	2	0	0	0	0	23
Scranton	0			27		8	0		0	0	

City reports for week ended Apr. 27, 1935—Continued

State and city	Diphtheria, cases	Influenza		Measles, cases	Pneumonia deaths	Scarlet fever, cases	Smallpox, cases	Tuberculosis, deaths	Typhoid fever, cases	Whooping cough, cases	Deaths, all causes
		Cases	Deaths								
Ohio:											
Cincinnati	4	-----	3	10	11	21	0	9	0	1	149
Cleveland	6	33	2	530	21	66	0	12	0	36	206
Columbus	2	2	2	146	5	18	0	2	1	4	96
Toledo	0	1	1	144	2	11	0	2	0	10	54
Indiana:											
Fort Wayne	2	------	0	8	1	3	0	0	0	1	25
Indianapolis	0	------	1	158	17	14	0	3	0	25	107
South Bend	0	------	0	1	1	8	0	0	0	0	14
Terre Haute	0	------	0	0	0	1	0	0	0	0	20
Illinois:											
Chicago	27	7	7	1, 549	52	716	0	34	1	65	712
Springfield	1	1	0	24	6	19	0	3	0	11	27
Michigan:											
Detroit	6	2	1	2, 503	42	103	0	13	0	97	290
Flint	1	------	0	19	7	16	0	0	0	2	33
Grand Rapids	0	------	1	196	4	18	0	2	0	15	42
Wisconsin:											
Kenosha	0	------	0	42	1	22	0	0	0	2	5
Milwaukee	1	1	1	234	4	90	0	4	0	27	99
Racine	0	------	0	114	0	9	0	1	0	19	19
Superior	0	------	0	28	0	2	0	1	0	2	12
Minnesota:											
Duluth	0	------	0	184	0	8	0	2	0	2	29
Minneapolis	0	------	0	180	9	203	0	1	0	19	106
St. Paul	0	------	0	34	7	100	0	0	0	12	63
Iowa:											
Davenport	0	------	--------	0	-------	1	0	-------	0	0	--------
Des Moines	0	------	--------	76	-------	3	0	-------	0	0	36
Sioux City	2	------	--------	2	-------	2	0	-------	0	3	--------
Waterloo	-------	------	--------	1	-------	7	0	-------	0	8	--------
Missouri:											
Kansas City	3	------	0	96	7	12	0	2	0	4	82
St. Joseph	2	------	0	4	4	2	0	3	0	1	34
St. Louis	18	------	1	35	17	26	0	12	3	19	246
North Dakota:											
Fargo	0	------	0	6	2	7	0	1	0	2	7
Grand Forks	0	------	--------	0	-------	1	0	-------	0	0	--------
South Dakota:											
Aberdeen	0	------	--------	25	-------	1	0	-------	0	0	--------
Sioux Falls	0	------	--------	0	-------	0	0	-------	0	0	10
Nebraska:											
Omaha	2	------	0	79	8	4	4	5	0	2	66
Kansas:											
Topeka	-------	------	--------	-------	-------	-------	-------	-------	-------	-------	--------
Wichita	0	------	0	150	2	1	2	0	0	4	23
Delaware:											
Wilmington	0	------	0	11	10	1	0	2	0	0	45
Maryland:											
Baltimore	2	1	0	27	20	47	0	14	2	23	230
Cumberland	1	------	0	2	0	2	0	1	0	0	14
Frederick	0	2	0	1	1	3	0	0	0	0	7
Dist. of Columbia:											
Washington	9	1	1	56	20	64	0	15	1	6	188
Virginia:											
Lynchburg	0	------	0	10	0	1	0	0	0	18	12
Norfolk	1	------	0	34	6	1	0	0	0	1	36
Richmond	0	------	0	76	2	0	0	3	0	0	45
Roanoke	0	------	0	19	1	0	0	0	0	3	15
West Virginia:											
Charleston	1	------	0	12	1	0	0	0	0	5	8
Huntington	0	------	--------	0	-------	0	0	-------	0	0	--------
Wheeling	0	------	0	86	5	15	0	1	0	0	19
North Carolina:											
Raleigh	0	------	0	3	3	0	0	0	0	8	18
Wilmington	0	------	0	3	0	0	0	0	0	5	8
Winston-Salem	1	------	0	0	1	0	0	1	0	13	12
South Carolina:											
Charleston	0	10	0	0	4	1	0	1	0	1	20
Columbia	-------	------	--------	-------	-------	-------	-------	-------	-------	-------	--------
Greenville	0	------	--------	-------	-------	0	0	-------	0	3	--------
Georgia:											
Atlanta	3	10	2	2	8	2	0	7	0	4	80
Brunswick	0	------	0	0	0	0	0	0	0	4	3
Savannah	0	------	2	0	2	0	0	6	0	0	32

City reports for week ended Apr. 27, 1935—Continued

State and city	Diphtheria, cases	Influenza		Measles, cases	Pneumonia, deaths	Scarlet fever, cases	Smallpox, cases	Tuberculosis, deaths	Typhoid fever, cases	Whooping cough, cases	Deaths, all causes
		Cases	Deaths								
Florida:											
Miami	1	1	1	4	0	1	0	2	0	4	31
Tampa	0	2	2	53	1	1	0	0	0	2	30
Kentucky:											
Ashland	0	------	--------	6	------	0	0	------	1	0	--------
Lexington	0	------	--------	5	2	1	0	2	0	5	20
Louisville	4	------	0	247	11	28	0	4	1	13	91
Tennessee:											
Memphis	2	------	1	2	8	2	0	3	0	19	88
Nashville	1	------	0	1	0	3	0	4	0	4	50
Alabama:											
Birmingham	0	5	0	22	6	1	0	3	0	4	53
Mobile	2	------	0	7	2	0	0	0	0	--------	29
Montgomery	1	------	--------	13	------	0	0	------	0	1	--------
Arkansas:											
Fort Smith	------	------	--------	------	------	------	------	------	------	--------	--------
Little Rock	0	------	2	27	8	0	0	4	0	12	16
Louisiana:											
New Orleans	17	6	1	33	15	8	0	11	0	0	162
Shreveport	0	------	0	2	5	0	0	4	1	0	30
Oklahoma:											
Tulsa	0	------	--------	2	------	0	0	------	0	13	--------
Texas:											
Dallas	5	2	2	0	7	1	0	3	0	8	50
Fort Worth	0	------	0	------	7	4	0	1	0	0	45
Galveston	0	------	0	0	1	0	0	2	0	0	25
Houston	5	------	1	3	4	0	3	3	0	0	59
San Antonio	4	------	1	0	4	1	0	6	0	0	52
Montana:											
Billings	1	------	--------	11	------	0	0	------	0	0	6
Great Falls	0	------	0	12	3	0	0	0	0	17	9
Helena	0	------	0	10	0	0	0	0	0	2	3
Missoula	0	------	0	15	0	0	0	0	0	0	3
Idaho:											
Boise	------	------	--------	------	------	------	------	------	------	--------	--------
Colorado:											
Denver	5	43	2	167	3	121	0	5	0	6	73
Pueblo	0	------	0	94	1	5	0	1	0	12	13
New Mexico:											
Albuquerque	1	------	0	8	1	1	0	1	0	1	7
Utah:											
Salt Lake City	0	------	0	2	2	131	0	0	0	120	24
Nevada:											
Reno	0	------	0	0	0	0	0	0	0	0	3
Washington:											
Seattle	0	------	1	245	6	8	0	5	0	7	95
Spokane	0	1	1	118	5	8	0	0	0	3	29
Tacoma	1	------	1	1	4	0	0	0	0	1	26
Oregon:											
Portland	0	------	0	113	7	13	0	0	0	1	94
Salem	0	------	--------	2	------	1	0	------	0	0	--------
California:											
Los Angeles	13	26	2	71	19	42	2	25	0	19	313
Sacramento	1	------	0	250	2	7	0	2	0	1	32
San Francisco	0	2	0	56	9	11	0	10	1	23	160

City reports for week ended Apr. 27, 1935—Continued

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts:			
Boston	1	0	0
Fall River	1	1	0
Rhode Island:			
Providence	1	0	0
New York:			
New York	22	6	0
Pennsylvania:			
Philadelphia	3	2	0
Pittsburgh	1	2	0
Ohio:			
Cincinnati	13	5	0
Cleveland	3	2	0
Toledo	1	1	0
Indiana:			
Indianapolis	1	0	0
Terre Haute	1	0	0
Illinois:			
Chicago	11	1	0
Michigan:			
Detroit	2	0	0
Wisconsin:			
Milwaukee	1	1	0
Iowa:			
Sioux City	2		0
Missouri:			
Kansas City	0	1	0
St. Joseph	2	1	0
St. Louis	2	1	0
Maryland:			
Baltimore	6	1	0
Cumberland	1	0	0
District of Columbia:			
Washington	4	1	0
Virginia:			
Lynchburg	1	0	0
Florida:			
Miami	0	1	0
Kentucky:			
Ashland	1	0	0
Lexington	1	1	0
Louisville	5	0	0
Tennessee:			
Memphis	1	1	0
Nashville	1	0	0
Alabama:			
Montgomery	1		0
Arkansas:			
Little Rock	0	1	0
Louisiana:			
New Orleans	0	0	1
Oklahoma:			
Tulsa	1	1	0
Washington:			
Seattle	0	1	0
Spokane	2	1	0
Tacoma	1	1	0
Oregon:			
Portland	1	2	0
California:			
Los Angeles	1	0	0
San Francisco	0	0	1

Epidemic encephalitis.—Cases: New York, 2; Newark, N. J., 1; Toledo, 1; Chicago, 1; Kansas City, Mo., 1; Louisville, 1. Instead of 15 cases of epidemic encephalitis, 1 case should have been published in the Public Health Reports of Apr. 12, 1935, p. 533, as occurring at Louisville, Ky., during the week ended Mar. 23.

Pellagra.—Cases: Boston, 2; Savannah, 1; New Orleans, 2; Los Angeles, 1; San Francisco, 1.

Typhus fever.—Cases: New York, 1; Savannah, 1; Miami, 1.

FOREIGN AND INSULAR

ITALY

Communicable diseases—4 weeks ended February 3, 1935.—During the 4 weeks ended February 3, 1935, cases of certain communicable diseases were reported in Italy, as follows:

Disease	Jan. 7-13		Jan. 14-20		Jan. 21-27		Jan. 28-Feb. 3	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	10	10	10	9	12	11	9	9
Cerebrospinal meningitis	10	9	11	10	11	8	6	6
Chicken pox	454	131	285	89	348	110	302	123
Diphtheria and croup	528	285	563	283	483	264	497	259
Dysentery	6	5	4	4	3	3	1	1
Lethargic encephalitis					1	1		
Measles	1,936	305	1,963	257	2,105	307	2,209	333
Poliomyelitis	3	3	5	5	6	6	4	4
Scarlet fever	303	123	249	96	333	117	217	108
Typhoid fever	315	168	299	158	239	143	206	142

PANAMA CANAL ZONE

Communicable diseases—January-March 1935.—During the months of January, February, and March 1935, certain communicable diseases, including imported cases, were reported in the Panama Canal Zone and terminal cities, as follows:

Disease	January		February		March	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chicken pox	10		2		17	
Diphtheria	9		10	1	4	
Dysentery (amoebic)	25		21		18	2
Dysentery (bacillary)				2	2	2
Leprosy					1	
Malaria	137	4	177	1	89	5
Measles	2		1		4	
Mumps	4				1	
Paratyphoid fever			1			
Pneumonia		17		18		19
Relapsing fever					1	
Tuberculosis		31		26		26
Typhoid fever	1		3			
Typhus fever	1	1	1			
Whooping cough	8	1		1	3	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE —A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Apr 26, 1935, pp 580–594 A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued May 31, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month)

Plague

Hawaii Territory—Hawaii Island—Hamakua District—Pohakea.—On April 24, 1935, 1 plague-infected rat was reported at Pohakea, Hamakua District, Island of Hawaii, Hawaii Territory.

Senegal—Thies.—During the period April 11–20, 1935, 1 case of plague with 1 death was reported at Thies, Senegal.

United States—California.—A report of 7 plague-infected ground squirrels in Modoc County, California, will be found on page 657 of the PUBLIC HEALTH REPORTS for May 10, 1935.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 39; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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THE EXPERIMENTAL PRODUCTION OF SILICOSIS [1]

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By subjecting guinea pigs and rabbits to an atmosphere containing quartz dust 8 hours a day for 6 days a week over a period of 1 year or more, it has been possible to reproduce the lesions characteristic of silicosis in man (*1*). The dust employed is known commercially as "silica smoke"; it contains 90.75 percent of free silica, with iron and alumina as the other major components. Petrographic analysis by Dr. Gabriel, of the United States Bureau of Mines, showed a silica of the chalcedony type, with 15 to 20 percent of normal quartz. In a dusting room 8 by 8 by 8 feet in dimensions, an average concentration of approximately 4,000 million particles per cubic foot of air has been maintained. Over 88 percent of the dust particles in the experimental atmosphere were less than 1.5 microns in diameter and only about 1 percent of them varied between 1.5 and 10 microns. Surviving [2] guinea pigs were killed at intervals during a dust exposure of 790 days. From the examination of their tissues it has been possible to reconstruct a picture of the development of the disease.

THE SILICOTIC NODULE

The essential lesion of silicosis is the silicotic nodule. Its formation depends upon a peculiar activity of phagocytes which have ingested particles of pure quartz. Either because they are stimulated by such particles or because their normal rate of motility is not impeded by the ingestion of an excessive number of particles, the cells migrate rapidly to the nearest mass of lymphoid tissue. As many cells as possible penetrate into the substance of the nodule; the majority remain there while some pass through and are carried to other nodes by centripetal lymph currents. The result is a concentration of the dust in lymph nodules. Silica is toxic and in time its effects are manifested in the phagocytes. Their cytoplasm

[1] The experimental work was carried out in cooperation with the Office of Industrial Hygiene and Sanitation of the U. S. Public Health Service. Submitted for publication in January 1932.

[2] Of the 106 guinea pigs used for this work, 25 percent died of pneumonia and another 25 percent showed more or less evidence of it when they were killed. A small group of 11 rabbits were also exposed, and they have proved more satisfactory, as no pneumonia developed.

degenerates with the appearance of stainable fat, and their nuclei gradually disintegrate. With the death of the cell, the ingested particles are liberated and new cells engulf them, only to suffer the same fate. By a constant repetition of this process both the irritating dust and hypothetical products of cellular activity upon it are liberated in high concentrations in intimate contact with the connective tissue elements of the lymph nodule. They proliferate and form a lesion which at first resembles a tubercle composed of epithelioid cells.

Silver impregnation reveals that the new cells produce reticulin fibrils which are entirely lacking about the motile phagocytes. The proliferating cells, which are at first spherical or ovoid, gradually elongate and assume a spindle form, giving the area the appearance of a cellular fibrosarcoma with numerous mitotic figures. As they mature, the older cells at the center of the area produce increasing amounts of intercellular substance which compresses and ultimately destroys most of the nuclei. Finally the swollen fibers undergo the peculiar hyaline degeneration characteristic of the silicotic nodule. The cells at the periphery, on the other hand, are not generally involved, and they persist as a capsule of loose fibrous tissue about the nodule.

It is believed that the hyalinization may be the result of specific action of silica upon the reticulum. At the center of the nodule, where the silica is perhaps most concentrated, a few fibrils at first become thick and stain intensely with eosin. Gradually the process extends peripherally by an involvement of more fibrils. Still further degeneration may occur, in which case the hyaline becomes fragmented and granular in appearance, quite like caseous matter. Frequently in the rabbit and occasionally in the lymph nodes of the guinea pig such degeneration is followed by extensive calcification. It is believed that the degeneration is another manifestation of the toxicity of silica rather than an effect of local anaemia. In many instances the nodules are extremely vascular, and necrosis may occur close to thin-walled vessels. Later in the disease, fibrosis may compress and render such blood vessels temporarily invisible; but if, as frequently happens, a terminal failure of the right heart ensues, these vessels again become engorged, demonstrating that their occlusion is not yet permanent.

The silicotic nodule in many ways resembles a tubercle; in fact, Mavrogordato has called it a "pseudotubercle." Both lesions develop characteristically in lymphoid tissue; both are due to a proliferation of cells which are indistinguishable by any method of staining yet employed, including "supravital neutral red" and silver impregnations. Giant cell formation is common in each lesion. Both exhibit degenerative changes which may be followed by calcification. As will

be shown, both are progressive lesions, but in the case of the silicotic nodule this is, of course, only true in a restricted sense, for obviously quartz particles do not multiply like living tubercle bacilli. The silicotic nodule is generally more regular in outline than the tubercle, and in the lung its surface is generally covered by a more or less definite layer of cuboidal epithelium. Unlike the tubercle, the silicotic nodule frequently encloses a variable number of more or less patent but distorted air spaces. They are lined by cuboidal epithelium, and their lumina often contain phagocytes, dust particles, and cellular debris. As already mentioned, potentially functional blood vessels can be demonstrated in the degenerated center of the silicotic nodule, while in the tubercle they are obliterated early in the development of the lesion. Peripheral infiltration with lymphoid cells, one of the characteristic features of the tubercle, is scanty in the silicotic nodule. In the guinea pig, metastasis of dust from the lung produces disease in the spleen, liver, and abdominal lymph nodes, the same organs which are also involved in tuberculosis.

EVOLUTION OF SILICOSIS

In the lung of the experimental animal the disease evolves in the following manner: Inhaled dust particles are phagocytosed by alveolar cells which rapidly migrate to the nearest lymph nodules. Many of the dust cells remain in the intrapulmonary lymphoid tissue and initiate reaction, but the most extensive accumulation occurs within the tracheobronchial lymph nodes, for they receive the drainage from all portions of the lungs. In them the reaction develops most rapidly and results in a progressive silicosis. The flow of lymph is obstructed, and as a consequence there results a dilatation of the afferent lymphatics located for the most part within the lungs. When lymph stasis has become marked, more dust is held within the intrapulmonary lymph nodules, and these structures are in their turn replaced by sclerosing lesions. Finally, when the lymphatic apparatus is completely disorganized, dust is transported into almost any portion of the pulmonary framework, the alveolar septa, the pleura, the interlobular septa, and the sheaths of bronchi and blood vessels. It stimulates the connective tissue cells, which proliferate to produce both diffuse and nodular fibrosis.

Thus in the parenchyma of the lung typical nodular lesions may develop either about lymphoid tissues or later at any point within the alveolar septa. Involvement of lymphoid nodules along the deep lymphatic trunks which accompany bronchi or blood vessels, produces a characteristic "beading" with nodules which have been interpreted as thrombi within the lymph vessel. This study has shown that such lesions develop entirely outside the lining endothelium

of the lymph vessel and that as they expand they encroach upon its lumen, but that they always remain extravascular. Therefore they cannot be considered as thrombi. Silicotic nodules which develop in the lymphoid tissue at the junction of the deep and superficial set of lymphatics will produce characteristic pleural or subpleural nodules. Later, extralymphoid nodules also appear in the pleura. About all lymph vessels whose proximal portions are obstructed or closed there are sheaths of cellular connective tissue. At first these sheaths contain relatively small amounts of dust, and the proliferation in this case may be due to toxic products which diffuse through the walls of the lymphatics; later, more local dust and attendant fibrosis becomes visible. Collars of perilymphatic fibrosis containing heavy deposits of dust have been interpreted to indicate a serious interference with the flow of lymph.

METASTATIC SILICOSIS

The guinea pig, of all animals thus far studied, seems peculiarly inclined to develop metastatic silicosis in the abdominal viscera and lymph nodes. All silicotic animals, including man, exhibit characteristic sclerosis in the hepatic lymph nodes located about the head of the pancreas. In the guinea pig, however, fibrosis in this node is followed by the formation of fine miliary nodules in the portal connective tissues of the liver which have been observed to progress through the stage of cellular fibrosis with early hyaline formation. The pancreas is not involved, but the spleen in this animal regularly develops typical silicotic nodules located usually about small arterioles. The other abdominal lymph nodes are not involved. In rabbits, abdominal disease is confined to the hepatic lymph nodes. In man, these nodes are regularly involved and occasionally nodules appear in the spleen. It is believed that subdiaphragmatic silicosis is a result of bloodstream metastasis of dust particles. An infectious process in the lungs accelerates such metastasis and favors the development of nodules in the other viscera probably because of the increased permeability of the pulmonary vessels. The regular occurrence of abdominal silicosis in the guinea pig is perhaps due to anatomical peculiarities of this species.

TOXIC LESIONS

It has already been shown that silica injures phagocytes which have ingested particles of this substance, and it has also been shown that degeneration occurs in the centers of large silicotic nodules where large quantities of dust are concentrated. There is still another manifestation of toxicity which has not yet been mentioned. In lymph nodes where dust is accumulating, but not in other lymph nodes, the follicles exhibit degenerative changes analagous to those

seen in diphtheria and other toxic infections. The follicles undergo hyperplasia and the cells then degenerate. The debris is ingested by mononuclear cells, and usually a few polynuclear leucocytes are attracted to the area. The destroyed cells do not regenerate but are replaced by scar tissue. This reaction, together with the specific silicotic nodules developing in the medulla of the node, finally result in a complete sclerosis of the entire organ.

It has been claimed that nephritis is common in silicosis and its occurrence has been attributed to the elimination of soluble silica through the kidney. More recent figures from South Africa fail to support this contention, and the experimental study under discussion likewise offers no evidence for such a belief. No trace of a toxic reaction has been detected in the kidney of either rabbits or guinea pigs. Nodular silicosis has not been observed in this organ presumably because of the lack of lymphoid tissue or other mechanism for the localization of particulate matter.

Wherever toxic reactions are detected, there are also deposits of dust in the immediate vicinity, be it in leucocytes, lymph nodes, or silicotic nodules. Such a relationship suggests that little free toxic material liberated from dissolved silica particles circulates within the body fluids for any length of time. The evidence favors the chemical hypothesis of the biological activity of silica. It seems to indicate that if the silica is dissolved, the products which are formed probably recombine either with free ions or with the tissues themselves so that no poisonous substance circulates in the blood to injure remote organs like the kidneys.

PROGRESSIVE NATURE OF SILICOSIS

An incomplete experiment on rabbits emphasizes the well-recognized capacity of silicotic lesions to progress after the cessation of the dust inhalation. A small group of these animals has been exposed to the above-mentioned concentration of quartz dust for a period of 13 months. During this period serial roentgenograms of their chests showed no definite change until about the eleventh month, when a few fine, discrete nodules became visible in the lower lung fields. The mediastinal condition could not be observed because of the relatively large heart shadow in the rabbit. At the end of the exposure, one animal was killed, and a section of its lung showed multiple nodules in the position of the lymphoid tissues, with relatively few dust cells distributed throughout the air spaces. The remaining rabbits were set aside in a normal atmosphere without further dust exposure. The amount of disease visible by X-ray is still continuing to increase, and in several animals which have been killed the size of the nodules is becoming progressively larger. It would appear that either the irritating silica inside the nodule is still in a form capable of provoking

further reaction or that phagocytes continue to transport silica from their air spaces to the periphery of the nodule.

DISCUSSION

The evolution of experimental silicosis is consistent with clinical and radiographic observations in human beings. The early sclerosis of the tracheobronchial lymph nodes followed by stasis and perivascular inflammation about the afferent lymph vessels accounts for the widening of the mediastinal shadow and the accentuation of the linear markings seen in roentgenograms. The coincident development of a few small nodules in the intrapulmonary lymphoid tissues is also visualized in the X-ray film. The production of diffuse reaction in the stroma of the lung gives rise to the ill-defined haze Pancoast and Pendergrass (*2*) have described in certain cases of human silicosis. The subsequent enlargement of preexisting nodules in lymphoid tissues and the late development of other nodules at various points in the framework of the lungs is responsible for the terminal nodular appearance of uncomplicated silicosis. The progressive nature of the disease has been emphasized by the experience with rabbits allowed to survive after discontinuing the dust exposure. It has been shown that silicosis can develop without the complicating factor of infection. Where a coexisting tuberculosis or pneumonia intervenes, the process develops more rapidly and spreads throughout the lung and other viscera.

Finally, a comparison of the reaction to quartz dust with that to other types of dust, like carborundum, soft coal, asbestos, and granite, has indicated that there are definite differences in the response to different types of dust.

In the case of quartz the activity of the phagocytes is responsible for the concentration of adequate quantities of an irritating chemical substance in direct contact with the connective tissues, notably those in lymphoid areas. A rapid proliferation in the form of nodules is the result. *Granite* also contains free silica, but other elements in its composition appear to modify the effect of the silica upon the phagocytes and perhaps upon the connective tissues as well. It is generally accepted that silicosis develops slowly in granite workers. Russell, Britten, Thompson, and Bloomfield (*3*) state that "nodular formations or mottlings (seen by X-ray) * * * were conspicuously absent in these cases. Silicosis in granite cutters differs in this way from the usually described case of the South African workers." In the lungs obtained by these investigators from autopsies of Barre granite cutters the author of this paper found no nodule formation after an exposure of 2½ years, but after 20 years such lesions were numerous. In experimental animals granite inhalation for as long as 4 years has produced nodular fibrosis only in the tracheobronchial lymph nodes,

while in the lungs there were evidences of lymph stasis and perilymphatic fibrosis. Nodular lesions of the lungs have never been reproduced. It would appear that, in the case of granite, the phagocytes at first fail to concentrate sufficient quantities of dust within the intrapulmonary lymphoid tissues to produce nodular reaction. Late in the disease, when the tracheobronchial lymph nodes are completely sclerosed and lymph stasis is well advanced, the continued inhalation of dust results in the development of local concentrations of dust within the lung adequate to produce nodular lesions. It is the author's opinion that the difference in the reactions to quartz and granite is not entirely due to the lower concentrations of silica in granite dust, but that the nonsiliceous components of this dust modify the behavior of the phagocytes so that they do not concentrate the irritating silica with the same rapidity that they do in the case of quartz.

Asbestos is a silicate of magnesium which has been shown by clinical and experimental (*4*) observations to be capable of producing pulmonary fibrosis. It is largely composed of fibers which, when they are inhaled, do not penetrate into the terminal air passages, but the majority of them come to rest in the tubular respiratory bronchioles. Their size and possibly other properties prevent their transportation by migrating phagocytes. Because of this fact the initial fibrosis in asbestosis does not develop as a nodule but as a sheath about the terminal bronchioles, in and about which the dust is largely localized.

Carborundum dust is particulate and consequently it is readily inhaled into the alveoli. The particles are ingested, often in tremendous quantities, by the available phagocytes, but these cells fail to migrate out of the air spaces in any great numbers. The dust which does reach the tracheobronchial lymph nodes apparently lacks the proper physicochemical properties to stimulate any but a very slight proliferation of connective tissues. In the lungs there is practically no fibrosis.

Soft coal dust in many respects behaves like carborundum within the lung. Both dusts are readily phagocyted, but coal-containing cells migrate somewhat more rapidly than those ingesting carborundum. The characteristic localization for coal-filled cells is in the connective tissues of the bronchi, a position which is apparently attainable through the lymph vessels. Coal appears to possess even less capacity than carborundum to excite proliferative fibrosis.

These observations on the responses to various types of inhaled dust have led to the formulation of the following hypothesis:

The capacity of a dust to excite proliferative reaction upon the part of the connective tissues depends upon two factors, viz, its inherent chemical or physicochemical irritative properties and its ability to

stimulate phagocytes so that they collect it in effective concentrations in intimate contact with the connective tissues.

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A COMMUNICABLE DISEASE METER[1]

A Device for Recording and Comparing the Current Incidence of Communicable Diseases

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Visualization of communicable disease incidence is an aid to efficient public health administration. The significance of this statement has been recognized to a limited extent for a number of years, and various mechanical devices have been suggested for the realization of the objective. In the present article the advantages of visualization will be discussed briefly and a practical method of meeting the requirements will be presented.

ADVANTAGES OF VISUALIZATION

Conceding that it is desirable for those actively engaged in combating communicable diseases to be acquainted with the current incidence of these maladies, it is obviously necessary or at least advantageous to display the information graphically. Ordinarily a health department records its communicable-disease data in statistical form, thereby making it immediately available only to those engaged in its compilation. When, on the other hand, these same data are graphically presented where all may see them, and in a manner that makes them readily understood, the information takes on added value and interest, not only for those charged with the control of communicable maladies but also for the regular and casual visitors in a health department. Thus, newspaper reporters, special writers, visiting public health officials, and citizens often express keen interest in such graphic devices.

[1] Published with the permission of the Commissioner of Health, New York City, who assumes no responsibility for the views expressed.

To the immediate staff engaged in the control of communicable affections a device for visualizing the current morbidity incidence is of manifest value. Not only is the busy executive enabled to learn at a glance when a certain disease is prevailing to an unusual extent, but he is stimulated to sound early warnings and institute prompt offensive and defensive activities. In other words, there is placed at his disposal a sensitive indication for the unleashing of his available weapons against enemies that are often difficult to detect, cope with, and overcome.

EARLY EFFORTS TO PROVIDE GRAPHIC RECORDS

Among the devices proposed for this purpose was one devised by Hitchcock and Carey.[2] This figure took the form of a clock-like dial, one for each disease, on which the monthly endemic median index was designated by one of the movable hands, while the other hand pointed to the daily cumulative number of reported cases of the disease. The arrangement was described as a "time-saver for busy officials, whereby a serious condition is automatically brought to the attention of the staff."

Shortly after this, the writer,[3] then detailed with the bureau of communicable diseases of the Wisconsin State Board of Health, prepared a somewhat similar device, but one which utilized the principle of the thermometer instead of a clock dial. This figure was called an "indicometer" or index measurer, and was used, as well as improved upon, by a number of local health officers throughout the country. The principal improvement in this over Hitchcock and Carey's arrangement was the utilization of a logarithmic instead of an arithmetical recording scale.

FEATURES OF THE PRESENT DEVICE

The present status of the communicable disease meter, as used in the Bureau of Preventable Diseases of the Department of Health in New York City, can best be understood by referring to figure 1, which is a representation of the device in actual operation.[4] The 8 thermometer-like figures appear on a heavy sheet of bristol board, 28 by 44 inches in size, with slots extending from the bulb-like expansions to the tops of the columns. By an ingenious endless belt of

[2] John S Hitchcock and Bernard W Carey A median endemic index, Am Jour Pub Health, 9 5, 355, May 1919

[3] Robert Olesen Health by mail A new system of communicable disease control, Wisconsin Med. Jour, 18 9, 382, February 1920

[4] The writer is indebted to Mrs H M Cooper, graph and statistical clerk in the Bureau of Public Health Education, Department of Health, New York City, for executing the design and for offering many valuable suggestions which enhance its successful operation.

durable, maroon-colored paper, operating on rollers behind each slot, the column may readily be raised to the point desired.[5]

The three essential features of the communicable disease indicator, each of which will be discussed briefly, are as follows:

1. The index or monthly case expectancy;
2. The cumulative number of cases, represented by the movable column, which is raised when additional case reports are received;
3. The logarithmic scale.

1. THE INDEX

The index for each disease that it is desired to record should, for the best results, receive separate consideration, preferably with a view to the inclusion of local peculiarities. A median[6] endemic index is often useful but should be employed only after careful consideration of the numerous factors involved. As a result of experience and experimentation a reliable index can usually be evolved.

The factors influencing the selection of indexes may be better appreciated from the experience in New York City. The expected monthly incidence of the principal communicable diseases in this city during 1935, based either on endemic median or average indexes, is shown in table 1. An explanation of the factors exerting an influence upon the selection of the several indexes follows.

TABLE 1.—*Expected monthly incidence of communicable diseases in New York City during 1935, based on median or average indexes*

	Disease									
	Diphtheria	Influenza	Measles		Meningococcus meningitis	Pneumonia	Poliomyelitis	Scarlet fever	Typhoid fever	Whooping cough
Type of index	Average	Median	High median	Low median	Median	Median	Median	Median	Average	Median
Period of time	1930–34	1919–34			1911–34	1919–34	1911–34	1910–34	1927–34	1915–34
Number of years	5	16	17	8	24	16	24	25	8	20
January	350	504	1,960	150	21	2,580	5	1,098	22	394
February	320	539	2,196	229	23	2,825	4	1,201	22	413
March	332	419	5,053	494	29	2,341	3	1,592	24	541
April	331	212	6,172	649	26	1,745	4	1,431	24	614
May	323	98	5,900	978	23	1,542	4	1,245	26	563
June	288	35	3,871	884	22	987	7	679	33	524
July	196	17	1,368	354	20	498	21	260	55	401
August	121	16	241	127	16	563	37	122	131	509
September	115	32	114	44	19	522	55	146	100	440
October	145	59	134	55	13	816	47	241	67	297
November	197	81	504	71	15	1,141	18	428	33	298
December	278	149	1,086	131	18	1,551	6	769	22	384

[5] For this arrangement and the binding of the figure the writer is indebted to Mr. John F. Sullivan, bookbinder in the Bureau of Records of the New York City Department of Health.

[6] A median endemic index is obtained by arranging data, for instance the number of cases of scarlet fever reported during the same month during a period of years, in arithmetical sequence and selecting the middle number.

Diphtheria.—The index is an average, based upon a 5-year period from 1930 to 1934, because of a sharp drop in morbidity following the intensive application of toxoid immunization. Whether an average or a median is preferable over a comparatively short period marked by an even incidence is a point to be determined by experimentation.

Influenza.- Occasional epidemic figures are excluded when a median is prepared, provided, of course, a sufficient number of years are available. Apparently the New York City median indexes for influenza are reasonably sensitive. These indexes are based upon an experience of 16 years, from 1919 to 1934.

Measles.—A season of low measles incidence is commonly followed by a period of high incidence. Therefore, it is necessary, as shown in table 1, to prepare two sets of median indexes, using the one applicable at a given time. The low indexes are predicated upon an experience of 8 years, while those for high incidence are based on 17 years.

Meningococcus meningitis.—Because of the comparatively even morbidity of this disease it is possible to employ a long range selection of indexes, in this instance from 1911 to 1934, inclusive.

Pneumonia.- Here again the median has been used, the figures being based upon the period from 1919 to 1934.

Poliomyelitis.—Because of its usefulness in warning of an unusual incidence, the monthly median endemic indexes of poliomyelitis should be prepared with care. In New York City the medians show the months during which the highest and lowest incidence of the disease may be expected. These medians, with epidemic numbers pushed well out of the picture by the arithmetical arrangement of the data, cover the period from 1911 to 1934, 24 years.

Scarlet fever. The monthly indexes for this disease are medians, covering a period of 25 years, from 1910 to 1934. Experience during 1934 has shown that both the monthly and weekly median endemic indexes have been followed very closely. This is plainly shown in figure 2, where there is comparatively close agreement between the weekly expectancy and the weekly case reports of scarlet fever during the year 1934. In several instances the two figures coincided. At the time when this chart was prepared, the case records for the last 2 weeks in December were not available. So far, this is the only disease in which the current incidence so closely approximated the expectancy.

Typhoid fever.—Owing to the marked decrease in typhoid morbidity, beginning in 1927, the monthly indexes for this disease are averages covering the period from 1927 to 1934, inclusive. However, the indexes obtained from averages and medians, as shown in table 2,

approximate each other so closely that either might be useful in indicating expectancy.

TABLE 2.—*A comparison of monthly expectancies of typhoid fever in New York City, based on averages or medians, during the period 1927–34, inclusive*

Month	Average	Median	Month	Average	Median
January	19	22	July	55	55
February	21	22	August	123	131
March	24	24	September	96	100
April	21	24	October	73	67
May	26	26	November	31	33
June	31	33	December	22	22

Whooping cough.—As there is no marked periodicity in whooping cough morbidity, the medians in this instance are based upon an experience of 20 years. During 1934 there was an unusual incidence of this disease beginning in June, which was immediately noted on the index measurer.

From the examples given it will be quite obvious that the index, or expectancy, is a figure to be arrived at after continual observation, experimentation, and revision. At the end of each month the index must be changed to indicate the expectancy during the following month. Furthermore, it is desirable that all indexes be revised annually so that new trends may be included in the estimates.

2. THE NUMBER OF REPORTED CASES

A dependable statistical clerk should be charged with the daily adjustment of each of the columns, in accordance with the total number of cases of each disease reported. Thus, the column begins to rise on the first day of each month and is returned to the base line at the end of the month.

3. THE GRADUATIONS

The logarithmic graduations are convenient to show vividly the first few cases of each disease, especially diphtheria, poliomyelitis, scarlet fever, and typhoid fever. By this means the attention is directed to the incidence of cases and the need for early action is emphasized.

Examination of the several scales shows that due allowances have been made for excess incidence. Manifestly it is necessary for each community to employ a scale of such proportions as will meet local requirements. However, even when comparatively few cases are to be recorded, the logarithmic graduations will be found to have advantages over the evenly spaced arithmetical scale.

READING THE METER

It is not difficult to acquire the slight knowledge and experience necessary for reading and interpreting the information graphically displayed by this device. Figure 1, showing the readings during the actual use of the meter on December 6, 1934, conveys the following useful information:

Diphtheria. The diphtheria expectancy during December is 278 cases, while, to date, 21 cases have been reported. The disease prevails within normal bounds, though investigations are indicated to determine whether there is a grouping of cases. The continuation of the toxoid immunization campaign is likewise indicated.

Influenza. There is evidence of an unusual incidence of this disease, for the index will be exceeded at the present rate of case reporting. Dissemination of information known to be helpful under such circumstances would be timely.

Measles.- Experience has shown that a year of high measles incidence is usually inaugurated about the forty-seventh week. Therefore, while the high period should already have begun, 1,086 cases being the December expectation according to intensive calculations, the cumulative report of 10 cases indicates that the expectations have not yet been realized.

Pneumonia.— Closely allied to influenza and often considered in conjunction therewith, it appears that this disease is likewise due to approximate or exceed its expectancy. Warnings should be issued.

Poliomyelitis.—The disease, as may be expected at this season of the year, is quiescent and no cases have so far been reported during the month.

Scarlet fever.— The expectancy is 777 cases, this being a month of higher incidence, but the cumulative case report is 135, which is less than one-fifth of what may be expected on this day of the month. Hence, the disease is prevailing within normal bounds.

Typhoid fever. - It is unlikely that the expectancy of 22 cases will be reached, as the number of cases recorded during one-fifth of the month is three.

Whooping cough.— Undoubtedly the normal expectancy of 384 cases will be exceeded by the middle of the month. Educational measures for the lessening of the disease have already been instituted but so far have proved ineffective. Therefore, additional steps are required.

Supplemental monthly charts.—Because the communicable disease meter covers only a month at a time, it is helpful to maintain graphic representations showing what happened during the months preceding the period actually under observation. An example of such a chart is shown in figure 3. Here it will be seen that the height of each

column indicates the monthly expectancy while the hatched portions show the number of cases actually reported. The excess of cases

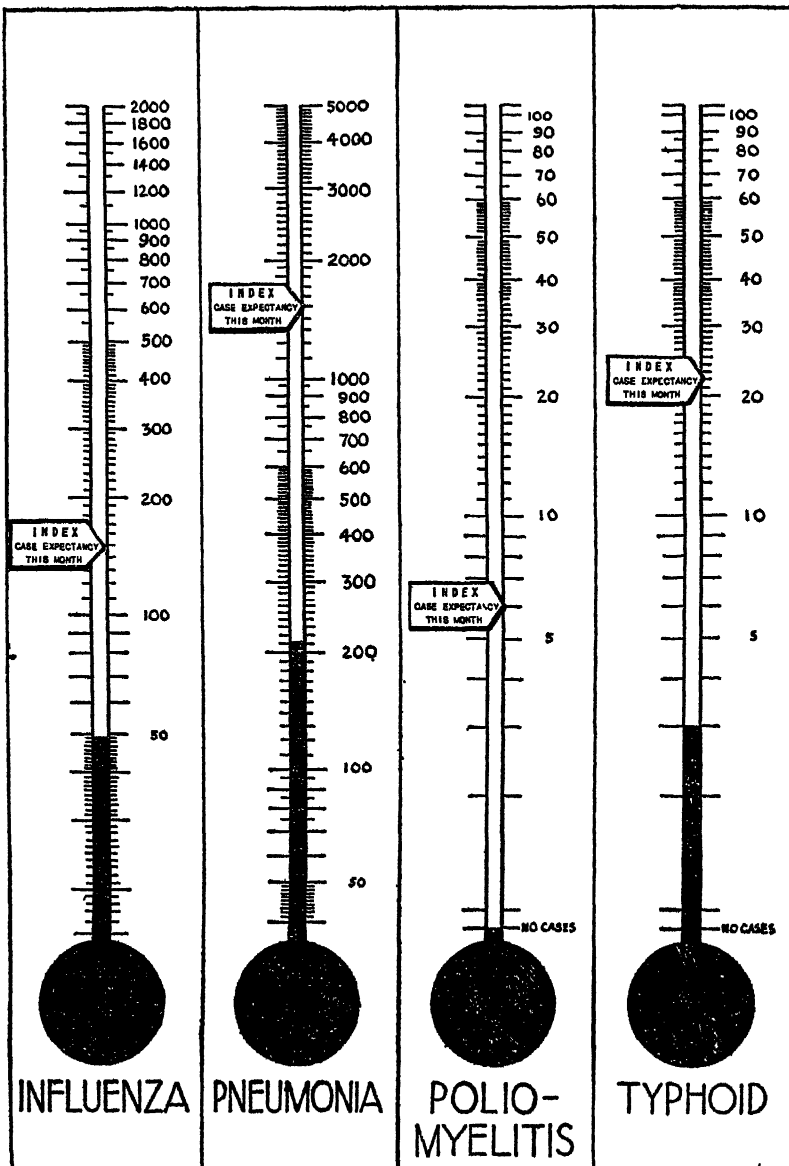
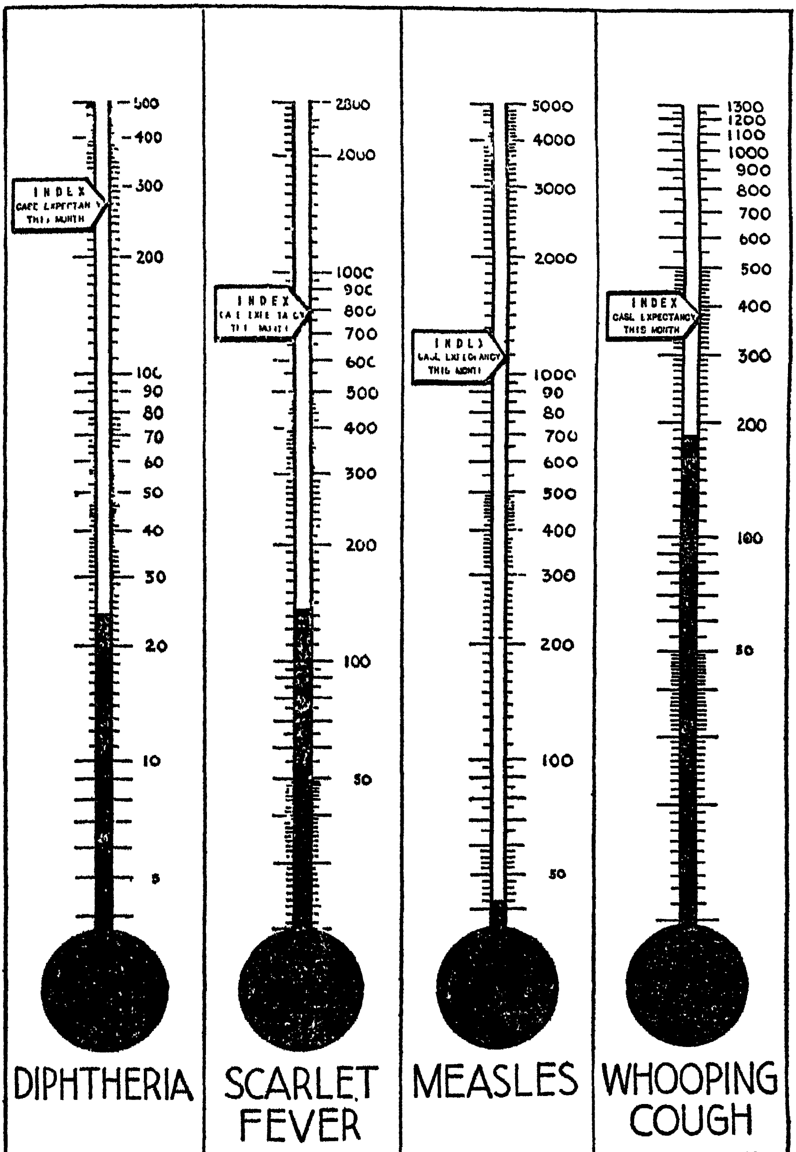


FIGURE 1.—The sections of the meter reproduced on this page and the page opposite show the actual readings on December 6, 1934.

over the expectancy is shown in solid black. Such a chart is useful in conjunction with current experience as displayed on the meter. At the end of the year such graphs become valuable permanent records.

ADAPTATION OF METER TO SMALLER COMMUNITIES

With the instructions given it should be a comparatively simple matter for any health officer to prepare indexes applicable to the con-



munity in which he operates. Moreover, the scale can likewise be adjusted to individual requirements. The device need not be elaborate or complicated; for, after all, a point that may be fixed once a

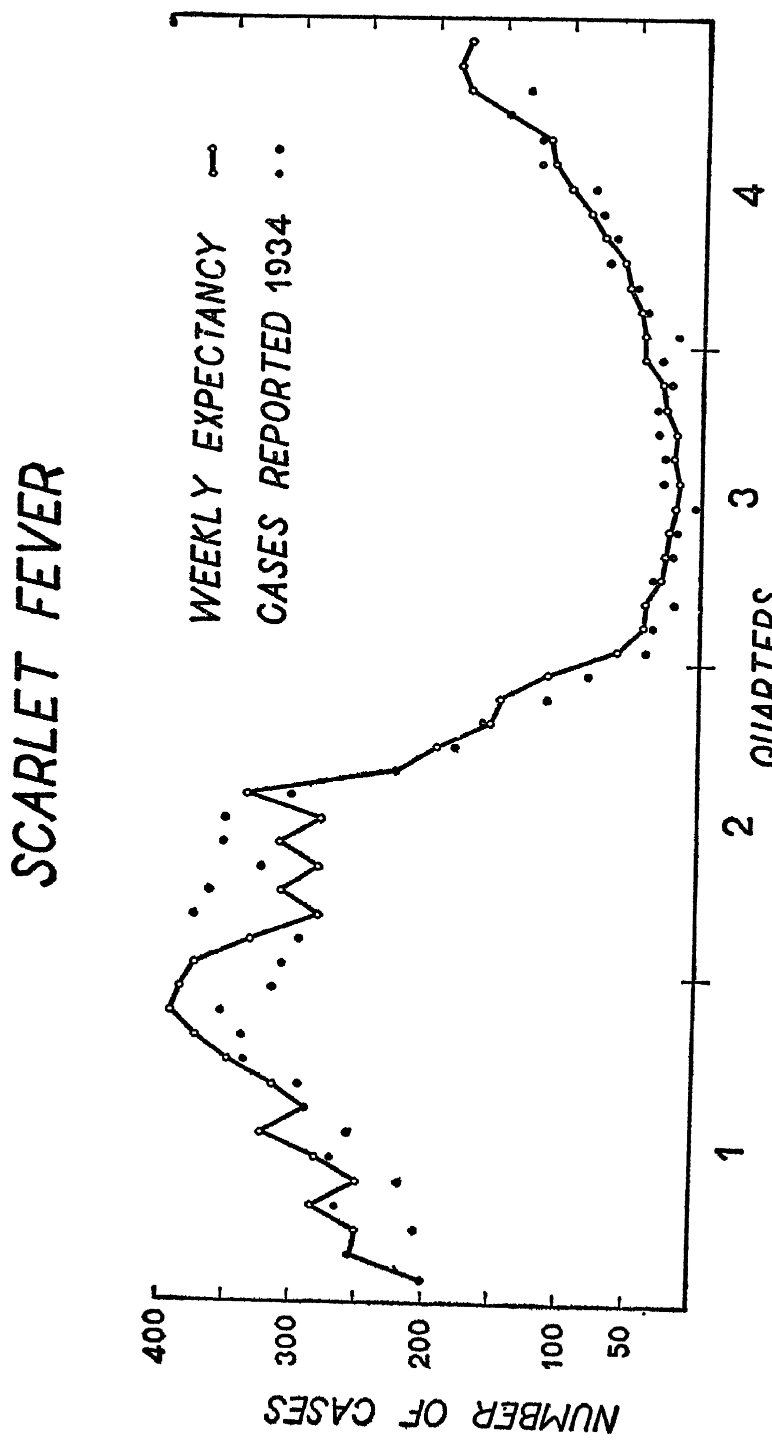


FIGURE 2.—Comparison of weekly median endemic indexes of scarlet fever in New York City with actual weekly reports of the disease during the year 1934

month and an indicator for the total reported cases is all that is needed for successful operation. Simple charts in black and white are invariably better than ornate, highly colored creations. Manifestly a workable and satisfactory meter can be devised by almost anyone. It is also quite likely that useful innovations and improvements can be made by many of the health officers who utilize the method described.

CAUTIONS TO BE OBSERVED

The device which has been presented must not be regarded as an automatic instrument possessing scientific accuracy. It is very far

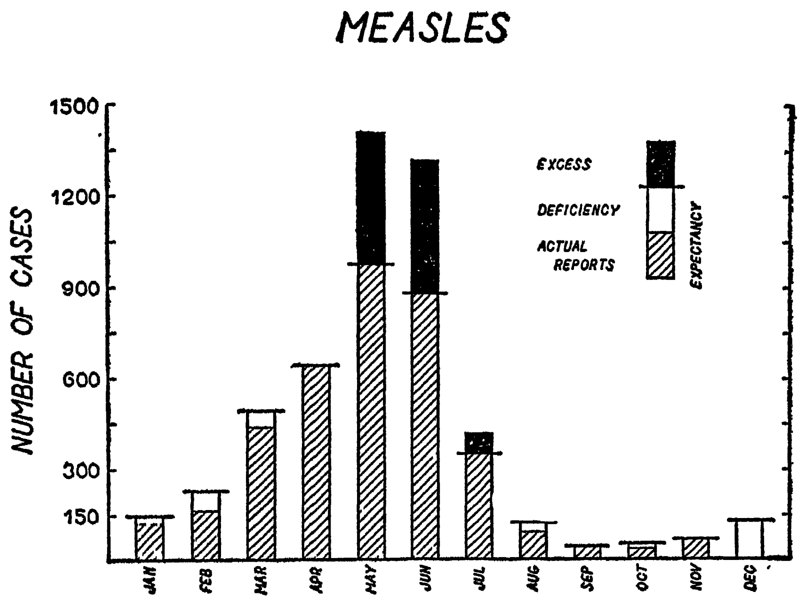


FIGURE 3.—Comparison of monthly median endemic indexes of measles in New York City with actual monthly reports of the disease during the year 1934.

from having such qualifications. However, if it will be remembered that this meter, with its obvious limitations, is designed to aid the health officer and inform others concerning the current incidence of communicable diseases, as well as to give timely warnings of unusual incidence, then its maintenance may be considered justifiable.

SUMMARY

A device has been described and the means of obtaining the necessary collateral data has been outlined whereby a cumulative record of actual communicable disease reporting may be compared with the expected incidence. This device, when it is intelligently used and the results are properly interpreted, should direct the health officer's

attention to an undue incidence of disease and thus aid in combating the affection. To some extent, also, it may assist in forecasting an unusual occurrence of one of the communicable diseases, thereby marshaling the resources of a health department before the blow descends.[7]

PERSONAL HYGIENE FOR FOOD HANDLERS IN NEW YORK CITY

On September 18, 1934, the Board of Health of New York City amended the section of the Sanitary Code which provided for the annual medical examination of food handlers. This amendment abolished the yearly examination, but prohibited persons affected with a communicable disease from working in a food-handling establishment and prohibited food dealers from employing any such persons. Medical examination of those engaged in the milk industry is still required.

This amendment was made only after the Commissioner of Health, Dr. John L. Rice, had become convinced that the routine medical examination of food handlers and the issuance of medical certificates had proved illogical and ineffective, and after the unqualified endorsement of the step by outstanding public health authorities, whose unanimous opinion was that such examinations were not of sufficient value to warrant the expense incurred.

The routine annual medical examination of food handlers was inaugurated by the New York City Department of Health in December 1915. At that time, according to Doctor Rice, the plan was adopted not only as an effort to impress upon food handlers the role

[7] Since this article was submitted for publication a suggestion has been offered for providing a direct reading of the "meter" by placing a *daily* expectancy scale on one side of each column. If, for instance, the expectancy of a disease is 60 cases in a 30-day month, the number of cases expected on the 1st day would be 2 cases, on the 5th day 10, on the 17th day 34, etc.

This daily expectancy can be indicated in the following manner: On the unnumbered edge of the slot a strip of clear cellophane about $\frac{3}{8}$-inch wide could be fastened so as not to interfere with the insertion of small daily indicators. Small pieces of red or green cellophane, pointed at the indicating end and approximately $\frac{1}{2}$ by $\frac{1}{4}$ inch in size, each bearing a number from 1 to the number of days in the month under consideration, could be inserted beneath the clear cellophane and pointed to the appropriate numbers on the scale. By this means a direct reading can be made without the need for mental calculation. Thus, on the 11th of the month, when 22 cases of the particular disease are expected according to past experience, there may actually have been reported 33 cases. The excess incidence of 9 cases is immediately apparent.

In preparing the daily case expectancy several points should be kept in mind:

1. The daily expectancy must be calculated each month for each disease. Furthermore, the daily indicators must be placed in their proper relation to the scale at the beginning of each month.

2. Communciable diseases do not ordinarily increase with mathematical regularity. Thus, a disease may prevail to a greater extent during the latter than the earlier portion of a month or vice versa and thereby fail to correspond to the expected number of cases on a given day. However, this irregularity is merely another indication of the meter's lack of mathematical precision, for which no claim has been made.

3. When the case expectancy is low, it may not be possible to utilize the daily accumulated expectancy except for a few widely separated days. In the event that a daily expectancy is not required, the indicators may be placed at intervals, as for instance the 10th, 20th, and 30th days of the month. This is a matter for determination by the experience with the several diseases.

This suggestion is entirely practicable, and it illustrates, as the author has predicted, one of the numerous improvements that can be made by persons examining or using the device.

played by infection in the spread of communicable diseases, but also as a means of encouraging the practice of periodic health examinations. At first the examinations were made only in special clinics established by the Department of Health; but later the privilege of making them was extended to private physicians, and in January 1933 the Department abolished its special clinics for these examinations. About 350,000 food handlers had been examined annually.

Doctor Rice states that overreliance on the physical examination has brought with it a diminishing emphasis on personal hygiene and general sanitation; and he believes that greater attention to personal cleanliness and sterilization of eating and drinking utensils will not only accomplish much more than the routine examination of food handlers, but will be much less costly. Personnel and money formerly devoted to this activity are now available for more productive health work.

In promoting the personal hygiene of food handlers, the following steps have been taken by the Department of Health:

1. An informative article entitled "Personal Hygiene of Food Handlers—An Obstacle to the Dissemination of Communicable Diseases" has been prepared which, with suitable modifications, is being used for the following purposes:

(*a*) Radio lectures.
(*b*) Newspaper "stories".
(*c*) Trade journals.
(*d*) Conventions of hotel, restaurant, and other associations.
(*e*) Groups of hotel and restaurant managers.
(*f*) Mimeographed or printed copies for any of the above.
(*g*) Lecture for inspectors in the Bureau of Foods and Drugs.

2. Placard emphasizing the importance of personal cleanliness on the part of food handlers for display in the washrooms of eating places. The distribution of 20,000 of these placards is well under way.

3. Folder for individual food handlers. This is a small, convenient, pocket-size booklet for distribution to each of the 350,000 food handlers in the city.

In addition to the steps that have actually been taken, it is the intention, as soon as funds can be procured, to print and distribute an adequate number of copies of the sections of the Sanitary Code relating to the cleanliness of food-handling establishments. Furthermore, efforts will be made to place a representative of the Department of Health on the programs of conventions, meetings, and other gatherings of people engaged in the various phases of food preparation and handling so that first-hand information on the subject may be given.

The amended section of the Sanitary Code reads as follows:

SECTION 146. *Employment of persons affected with a communicable disease prohibited; medical certificate required where milk is produced, pasteurized, etc.*—No

person who is affected with any disease in a communicable form or is a carrier of such disease shall work in any place where food or drink is prepared, cooked, mixed, baked, exposed, bottled, packed, handled, stored, manufactured, offered for sale, or sold, and no food dealer shall employ any such person or any person suspected of being affected with any disease in a communicable form or of being a carrier of such disease.

No person producing milk in the city of New York for the purpose of sale and no wholesale dealer in milk or cream or operator of a creamery or of a milk or cream receiving station, pasteurizing or bottling plant, or manufacturer of frozen desserts at wholesale in the city of New York, or whose products are shipped into said city shall employ any person, and no persons shall work in such place, unless he has filed with his employer a medical certificate signed by a duly licensed physician stating the date of examination, and that such person is free from any disease in a communicable form. Such medical certificate shall be good for 1 year from the date of such examination.

Under the new regulation the maintenance of disease-free food handlers is a responsibility in which both the employee and the employer must share. Moreover, in the event that a diseased food handler is discovered, both parties are liable to prosecution.

DEATHS DURING WEEK ENDED MAY 4, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended May 4, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	8,715	8,607
Deaths per 1,000 population, annual basis	12.1	12.0
Deaths under 1 year of age	533	641
Deaths under 1 year of age per 1,000 estimated live births	49	58
Deaths per 1,000 population, annual basis, first 18 weeks of year	12.6	12.5
Data from industrial insurance companies:		
Policies in force	67,870,719	67,748,069
Number of death claims	13,604	13,221
Death claims per 1,000 policies in force, annual rate	10.5	10.2
Death claims per 1,000 policies, first 18 weeks of year, annual rate	10.7	11.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended May 11, 1935, and May 12, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 11, 1935, and May 12, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 11, 1935	Week ended May 12, 1934	Week ended May 11, 1935	Week ended May 12, 1934	Week ended May 11, 1935	Week ended May 12, 1934	Week ended May 11, 1935	Week ended May 12, 1934
New England States:								
Maine	1	3	1	1	160	39	0	0
New Hampshire	1					122	0	0
Vermont	1				39	58	0	0
Massachusetts	10	14			374	1, 566	2	2
Rhode Island					319	56	1	0
Connecticut	5	2	1		1, 535	90	1	0
Middle Atlantic States:								
New York	35	39	[1] 10	[1] 9	3, 027	1, 205	19	3
New Jersey	27	18	7	12	2, 037	689	2	0
Pennsylvania	44	39			3, 543	3, 880	7	3
East North Central States:								
Ohio	30	29	26	67	1, 544	1, 944	27	3
Indiana	13	15	17	12	376	1, 296	3	0
Illinois	69	29	30	19	2, 188	2, 700	17	8
Michigan	7	14		3	5, 459	367	5	1
Wisconsin	2	3	8	43	1, 613	2, 558	1	1
West North Central States:								
Minnesota	12	17	2		585	326	0	0
Iowa	8	6	2	2	445	311	3	0
Missouri	18	48	54	41	487	883	7	6
North Dakota	1	2	2		30	213	0	0
South Dakota		3			38	256	1	0
Nebraska	3	12	11		234	423	3	2
Kansas	14	7	4	3	1, 034	836	2	0
South Atlantic States:								
Delaware		1	2		12	173	0	0
Maryland [2]	6	11	9	8	67	2, 504	12	1
District of Columbia	8	11	1			94	11	0
Virginia	9	12			581	1, 407	11	2
West Virginia	14	2	35	20	449	141	5	2
North Carolina	7	18	2	90	200	1, 861	2	1
South Carolina	4	7	80	246	29	411	1	0
Georgia [3]	10	2				498	2	0
Florida	6	8	1	2	50	578	1	0
East South Central States:								
Kentucky	9	11	10	13	506	418	6	1
Tennessee	12	5	28	21	112	487	4	2
Alabama [3]	13	9	51	36	164	645	1	3
Mississippi [2]	11	5					1	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 11, 1935, and May 12, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 11, 1935	Week ended May 12, 1934	Week ended May 11, 1935	Week ended May 12, 1934	Week ended May 11, 1935	Week ended May 12, 1934	Week ended May 11, 1935	Week ended May 12, 1934
West South Central States:								
Arkansas	--------	4	70	3	62	16	2	2
Louisiana	15	24	15	20	70	216	0	3
Oklahoma [4]	8	14	51	23	66	245	4	0
Texas [3]	38	72	92	171	161	774	0	1
Mountain States:								
Montana [5]	--------	5	16	25	364	89	2	0
Idaho [5]	--------	--------	1	--------	8	34	0	1
Wyoming [5]	1	--------	--------	--------	124	39	0	0
Colorado	7	11	--------	--------	307	1,082	0	0
New Mexico	5	3	5	--------	66	98	0	0
Arizona	2	1	10	1	11	62	2	1
Utah [2]	2	1	--------	5	14	107	0	0
Pacific States:								
Washington	4	1	--------	1	436	197	3	0
Oregon [5]	--------	1	32	--------	288	43	0	1
California	36	39	28	23	1,682	731	6	2
Total	528	578	714	920	30,896	32,768	177	52
First 19 weeks of year	12,527	14,748	98,748	43,528	521,529	504,033	2,664	1,079

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 11, 1935	Week ended May 12, 1934	Week ended May 11, 1935	Week ended May 12, 1934	Week ended May 11, 1935	Week ended May 12, 1934	Week ended May 11, 1935	Week ended May 12, 1934
New England States:								
Maine	0	0	12	22	0	0	1	13
New Hampshire	0	0	7	21	0	0	0	0
Vermont	0	0	9	5	0	0	1	4
Massachusetts	0	1	191	198	0	0	8	2
Rhode Island	0	0	10	14	0	0	1	0
Connecticut	0	1	108	70	0	0	0	0
Middle Atlantic States:								
New York	0	2	1,147	835	0	0	5	9
New Jersey	0	0	204	194	0	0	1	1
Pennsylvania	1	1	660	638	0	0	8	13
East North Central States:								
Ohio	0	1	664	909	0	1	5	6
Indiana	0	0	114	113	1	1	2	3
Illinois	0	1	1,287	513	4	5	6	2
Michigan	1	1	369	620	0	0	1	7
Wisconsin	2	0	431	335	10	32	1	1
West North Central States:								
Minnesota	0	0	367	90	9	6	1	1
Iowa	1	0	83	41	6	4	1	1
Missouri	0	2	60	79	1	7	5	7
North Dakota	0	0	56	41	1	0	0	2
South Dakota	0	0	11	6	9	1	0	0
Nebraska	1	0	80	25	28	12	0	5
Kansas	0	0	56	31	22	8	3	4
South Atlantic States:								
Delaware	0	0	6	11	0	0	0	3
Maryland [2]	0	1	54	38	0	0	5	14
District of Columbia	0	0	64	10	0	0	0	1
Virginia	3	0	26	24	0	0	6	10
West Virginia	0	0	63	57	0	0	9	7
North Carolina	0	0	8	18	1	1	3	2
South Carolina	0	0	3	2	0	0	5	7
Georgia [3]	0	0	12	4	0	1	9	3
Florida	1	0	3	2	0	0	1	4
East South Central States:								
Kentucky	0	0	38	44	0	0	6	9
Tennessee	0	0	21	13	1	2	6	2
Alabama [3]	1	0	7	6	1	0	4	0
Mississippi [3]	0	0	4	18	0	0	3	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 11, 1935, and May 12, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 11, 1935	Week ended May 12, 1934	Week ended May 11, 1935	Week ended May 12, 1934	Week ended May 11, 1935	Week ended May 12, 1934	Week ended May 11, 1935	Week ended May 12, 1934
West South Central States:								
Arkansas	2	1	6	8	0	1	2	5
Louisiana	2	0	10	27	0	6	14	14
Oklahoma [4]	4	0	14	16	2	4	5	1
Texas [3]	1	2	28	45	3	37	7	15
Mountain States:								
Montana [5]	0	1	7	15	9	1	0	1
Idaho [5]	0	1	3	3	0	14	1	1
Wyoming [5]	0	0	10	2	7	12	0	0
Colorado	0	0	149	15	3	5	0	0
New Mexico	0	0	13	13	2	0	2	0
Arizona	0	10	41	5	0	0	0	1
Utah [2]	0	0	91	8	0	4	0	0
Pacific States:								
Washington	2	0	61	40	25	2	3	8
Oregon [5]	0	0	57	36	3	6	1	3
California	7	20	218	172	18	1	4	11
Total	29	46	6,943	5,456	166	174	146	205
First 19 weeks of year	459	428	136,417	113,896	3,623	2,888	2,540	3,034

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended May 11, 1935, 12 cases, as follows: Georgia, 3; Alabama, 5; Texas, 4.
[4] Exclusive of Oklahoma City and Tulsa.
[5] Rocky Mountain spotted fever, week ended May 11, 1935, 17 cases, as follows: Montana, 11; Idaho, 1; Wyoming, 4; Oregon, 1.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
February 1935										
Wisconsin	6	11	733		8,204		1	2,702	113	5
March 1935										
Wisconsin	11	15	211		7,492		1	2,017	141	7
April 1935										
Arkansas	3	14	84	55	334	24	3	6	9	3
Florida	1	15	7	21	314	11	0	12	2	13
Indiana	24	74	144		1,819		1	722	9	2
Maine		5	12		690		1	49	0	15
Massachusetts	9	26		1	2,156	1	1	1,029	0	13
Nebraska	11	16	28		1,714		2	218	135	2
New Hampshire			3				0	45	0	1
North Carolina	13	52	50		1,180	62	8	87	5	20
Vermont		6			116		0	79	1	1

February 1935

	Cases
Wisconsin:	
Chicken pox	1,957
Epidemic encephalitis	1
German measles	2,496
Mumps	1,473
Ophthalmia neonatorum	3
Septic sore throat	5
Undulant fever	6
Whooping cough	992

March 1935

Wisconsin:	
Chicken pox	1,546
Epidemic encephalitis	4
German measles	12,415
Mumps	1,907
Septic sore throat	5
Trachoma	1
Undulant fever	5
Whooping cough	789

April 1935

Chicken pox:	
Arkansas	37
Florida	279
Indiana	497
Maine	149
Massachusetts	1,081
Nebraska	148
North Carolina	612
Vermont	119

April 1935—Continued

Dengue:	
Florida	
Dysentery:	
Florida (bacillary)	
Massachusetts (amoebic)	
Massachusetts (bacillary)	
Epidemic encephalitis:	
Indiana	
Massachusetts	
German measles:	
Maine	
Massachusetts	
North Carolina	
Lead poisoning:	
Massachusetts	
Mumps:	
Arkansas	77
Florida	200
Indiana	109
Maine	40
Massachusetts	486
Nebraska	255
Vermont	30
Ophthalmia neonatorum:	
Massachusetts	61
North Carolina	2
Rabies in animals:	
Indiana	89
Maine	1
Massachusetts	36
Rabies in man:	
North Carolina	

April 1935—Continued

Septic sore throat:	
Maine	3
Massachusetts	31
Nebraska	4
North Carolina	6
Trachoma:	
Arkansas	2
Maine	1
Trichinosis:	
Maine	43
Massachusetts	1
Tularaemia:	
Florida	2
North Carolina	2
Typhus fever:	
Florida	1
North Carolina	1
Undulant fever:	
Arkansas	3
Massachusetts	6
North Carolina	1
Vincent's infection:	
Maine	1
Whooping cough:	
Arkansas	131
Florida	91
Indiana	335
Maine	57
Massachusetts	522
Nebraska	24
North Carolina	1,651
Vermont	90

PLAGUE-INFECTED GROUND SQUIRRELS IN MODOC AND SAN LUIS OBISPO COUNTIES, CALIF.

Reports have been received from the Director of Public Health of California, of 7 plague-infected ground squirrels received at the laboratory May 3 and 6, 1935, from ranches in Modoc County, Calif., 12 to 13 miles west and 4 to 5 miles south of Alturas. Also, 1 plague-infected ground squirrel received April 26 from a ranch at Santa Margarita, San Luis Obispo County, was reported.

WEEKLY REPORTS FROM CITIES

City reports for week ended May 4, 1935

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	0	3	2	0	1	0	10	20
New Hampshire:											
Concord	0	------	0	0	3	3	0	0	0	0	12
Nashua	0	------	------	0	------	0	0	------	0	0	------
Vermont:											
Barre	0	------	0	9	1	0	0	0	0	1	------
Burlington	0	------	------	28	------	1	0	------	0	0	21
Massachusetts:											
Boston	4	------	3	33	28	45	0	18	1	78	246
Fall River	1	------	0	1	0	8	0	3	1	5	22
Springfield	0	------	0	100	3	12	0	0	0	7	37
Worcester	0	------	0	5	8	17	0	1	0	9	64
Rhode Island:											
Pawtucket	0	------	0	0	0	0	0	0	0	0	9
Providence	0	------	2	409	5	5	0	1	0	15	58
Connecticut:											
Bridgeport	0	------	0	10	3	9	0	2	0	1	43
Hartford	0	------	0	8	2	12	0	0	0	15	40
New Haven	0	------	1	552	2	1	0	0	0	0	------

City reports for week ended May 4, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
New York:											
Buffalo	0	-----	0	69	18	75	0	7	0	15	144
New York	17	-----	5	1,882	178	519	0	84	3	234	1,608
Rochester	0	1	0	163	11	16	0	2	0	29	84
Syracuse	0	-----	0	599	7	12	0	1	0	19	62
New Jersey:											
Camden	1	1	0	2	1	10	0	0	0	0	27
Newark	0	3	0	418	13	7	0	4	1	45	104
Trenton	0	-----	0	8	2	4	0	3	0	1	42
Pennsylvania:											
Philadelphia	2	5	5	92	49	128	0	14	2	90	538
Pittsburgh	3	8	6	484	42	30	0	9	0	11	180
Reading	1	-----	2	70	1	5	0	0	0	4	33
Scranton	0	-----	-----	44	-----	3	0	-----	0	1	-----
Ohio:											
Cincinnati	2	-----	3	12	21	25	0	8	0	2	144
Cleveland	5	23	2	342	28	58	0	14	0	35	218
Columbus	2	1	1	114	9	34	0	8	1	3	82
Toledo	1	1	1	133	3	7	0	9	0	6	79
Indiana:											
Fort Wayne	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Indianapolis	1	-----	1	217	21	16	0	4	0	14	102
South Bend	0	-----	0	2	1	3	0	0	0	0	11
Terre Haute	0	-----	0	0	0	1	0	1	0	0	21
Illinois:											
Chicago	20	6	2	1,407	77	647	0	52	0	48	731
Springfield	0	-----	0	16	4	17	0	0	0	5	28
Michigan:											
Detroit	6	-----	1	2,452	40	110	0	20	0	105	305
Flint	0	-----	0	13	3	21	0	1	-----	0	30
Grand Rapids	0	-----	0	219	0	12	0	2	0	9	30
Wisconsin:											
Kenosha	0	-----	0	24	1	12	2	0	0	6	8
Milwaukee	0	-----	0	208	6	142	0	6	0	51	91
Racine	0	-----	0	81	0	15	0	1	0	12	18
Superior	1	-----	0	20	0	1	0	0	0	0	8
Minnesota:											
Duluth	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Minneapolis	2	-----	2	130	8	162	0	1	0	13	114
St. Paul	2	-----	0	15	10	63	0	1	0	9	68
Iowa:											
Davenport	0	-----	-----	1	-----	0	0	-----	0	0	-----
Des Moines	0	-----	-----	390	-----	2	0	-----	0	1	28
Sioux City	0	-----	-----	11	-----	1	0	-----	0	4	-----
Waterloo	0	-----	-----	2	-----	4	0	-----	0	1	-----
Missouri:											
Kansas City	1	-----	0	84	10	7	0	3	0	2	101
St. Joseph	2	-----	0	4	10	1	0	1	0	0	39
St. Louis	7	-----	0	16	12	28	0	12	0	10	210
North Dakota:											
Fargo	0	-----	1	4	3	16	0	0	0	1	7
Grand Forks	0	-----	-----	0	-----	2	0	-----	0	3	-----
South Dakota:											
Aberdeen	0	-----	-----	13	-----	1	0	-----	0	0	-----
Nebraska:											
Omaha	2	-----	2	75	9	6	0	1	0	2	47
Kansas:											
Topeka	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Wichita	0	1	0	178	5	0	0	4	0	5	45
Delaware:											
Wilmington	1	-----	0	9	5	4	0	0	0	0	27
Maryland:											
Baltimore	3	4	2	43	29	70	0	15	0	34	234
Cumberland	0	-----	0	3	1	2	0	1	0	0	12
Frederick	0	-----	0	1	0	0	0	0	0	0	3
Dist. of Col.:											
Washington	7	-----	0	60	16	78	0	14	0	6	166
Virginia:											
Lynchburg	2	-----	0	12	2	4	0	2	0	23	18
Richmond	0	-----	2	65	6	1	0	5	0	0	64
Roanoke	1	-----	0	22	2	1	0	1	0	2	15
West Virginia:											
Charleston	1	-----	0	15	0	0	0	0	0	5	18
Huntington	0	-----	-----	6	-----	2	0	-----	0	0	-----
Wheeling	0	-----	0	115	4	5	0	1	0	0	21

City reports for week ended May 4, 1935—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
North Carolina:											
Raleigh	0	------	0	26	3	2	0	0	2	15	12
Wilmington	0	------	0	1	1	0	0	1	0	7	9
Winston-Salem	1	------	0	1	1	1	0	1	0	20	16
South Carolina:											
Charleston	0	3	0	0	3	0	0	0	0	0	26
Columbia	0	------	0	0	0	0	0	1	0	0	13
Georgia:											
Atlanta	3	4	4	4	11	4	0	6	0	4	78
Brunswick	0	------	0	0	1	0	0	0	0	0	4
Savannah	0	------	0	2	2	2	0	5	0	3	38
Florida:											
Miami	1	2	0	3	2	1	0	1	0	3	35
Tampa	1	1	1	51	1	1	0	1	0	2	27
Kentucky:											
Ashland	------	------	------	------	------	------	------	------	------	------	------
Lexington	0	------	0	0	3	0	0	2	0	4	20
Louisville	0	4	1	344	12	14	0	3	0	17	67
Tennessee:											
Memphis	4	------	1	1	12	8	0	6	0	10	90
Nashville	2	------	0	0	15	2	0	5	0	12	50
Alabama:											
Birmingham	1	------	2	32	4	2	0	2	0	3	61
Mobile	0	------	1	10	1	0	0	2	1	0	20
Montgomery	1	------	------	2	------	0	0	------	0	0	------
Arkansas:											
Fort Smith	------	------	------	------	------	------	------	------	------	------	------
Little Rock	1	------	0	16	0	1	0	1	0	4	------
Louisiana:											
New Orleans	------	------	0	22	13	14	0	10	1	0	134
Shreveport	1	------	0	4	8	0	0	3	2	0	40
Oklahoma:											
Oklahoma City	2	6	2	0	10	1	0	0	1	0	36
Tulsa	0	------	------	0	------	0	0	------	0	16	------
Texas:											
Dallas	3	------	0	0	5	4	0	1	0	0	55
Fort Worth	0	------	0	------	5	2	0	------	0	6	27
Galveston	0	------	0	0	1	0	0	0	0	0	8
Houston	14	------	0	2	8	0	0	4	0	0	68
San Antonio	0	------	0	0	6	0	0	2	0	0	40
Montana:											
Billings	0	------	0	12	0	1	0	0	0	0	5
Great Falls	0	------	0	6	1	0	0	0	0	7	17
Helena	0	------	0	5	2	0	0	0	0	4	4
Missoula	0	------	0	15	1	0	0	0	0	0	9
Idaho:											
Boise	0	------	0	1	1	2	0	0	0	0	10
Colorado:											
Denver	5	31	0	151	8	113	0	7	1	2	85
Pueblo	0	------	0	98	0	4	0	0	0	6	11
Utah:											
Salt Lake City	1	------	1	5	4	107	0	1	0	116	34
Nevada:											
Reno	0	------	0	1	0	0	0	1	0	0	5
Washington:											
Seattle	0	------	0	239	11	16	1	2	0	2	90
Spokane	0	------	0	76	3	4	0	0	1	0	37
Tacoma	0	------	0	8	2	2	5	0	0	0	26
Oregon:											
Portland	0	------	0	117	6	8	0	1	1	0	88
Salem	0	------	------	2	------	0	0	------	0	0	------
California:											
Los Angeles	7	28	2	61	------	52	13	21	1	15	324
Sacramento	1	------	0	226	0	15	3	5	0	4	27
San Francisco	3	------	0	53	7	22	0	11	1	40	179

City reports for week ended May 4, 1935—Continued

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Rhode Island:				Nebraska:			
Providence	0	2	0	Omaha	1	0	0
New York:				Maryland:			
New York	20	10	2	Baltimore	7	0	0
Syracuse	1	0	0	District of Columbia:			
Pennsylvania:				Washington	9	6	0
Philadelphia	1	0	0	Georgia:			
Pittsburgh	2	1	0	Atlanta	1	0	0
Ohio:				Florida:			
Cincinnati	7	4	0	Tampa	1	0	0
Cleveland	2	0	0	Tennessee:			
Toledo	1	1	0	Nashville	3	0	0
Indiana:				Arkansas:			
Indianapolis	4	0	0	Little Rock	3	0	0
Terre Haute	0	1	0	Louisiana:			
Illinois:				New Orleans	0	0	1
Chicago	17	4	1	Oklahoma:			
Michigan:				Oklahoma City	3	0	0
Detroit	2	2	0	Tulsa	1	1	0
Grand Rapids	1	1	0	Washington:			
Wisconsin:				Seattle	1	1	1
Racine	0	0	1	Spokane	1	1	0
Minnesota:				Oregon:			
Minneapolis	2	0	0	Portland	2	0	0
Iowa:				California:			
Des Moines	1	0	0	Los Angeles	0	0	1
Sioux City	3	2	0	San Francisco	0	1	1
Missouri:							
Kansas City	3	1	0				
St. Joseph	2	0	0				
St. Louis	3	0	0				

Dengue.—Miami, 1 case.

Epidemic encephalitis.—Cases: Springfield, Mass., 1; Philadelphia, 1; Pittsburgh, 1; Columbus, 1; Detroit, 2; Baltimore, 1; Washington, 1; Atlanta, 1; Missoula, 1; San Francisco, 1.

Pellagra.—Cases: Raleigh, 3; Charleston, S. C., 2; Atlanta, 3; Savannah, 7; Miami, 2; Tampa, 2; San Francisco, 1.

Typhus fever.—Cases: Baltimore, 1; Houston, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended April 6, 1935.—During the 2 weeks ended April 6, 1935, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				4	2					6
Chicken pox		17		262	436	108	89	20	102	1,034
Diphtheria		3		15	10	15	2			45
Dysentery				4	5					9
Erysipelas		1		6	11	2	1	2	2	25
Influenza		51		40	64				256	411
Measles		155	98	1,344	5,937	292	331	173	145	8,475
Mumps		8	1		485	53	1	23	84	655
Paratyphoid fever					2					2
Pneumonia		4			43		9		26	82
Poliomyelitis				1						1
Scarlet fever		22	19	270	280	39	23	20	58	740
Smallpox					2		1			3
Tuberculosis	3		15	153	120	16	11	4	33	355
Typhoid fever				16	6	1			6	29
Undulant fever					4		1		2	7
Whooping cough		2	3	162	302	39	124	5	76	713

ITALY

Communicable diseases—4 weeks ended March 3, 1935.—During the 4 weeks ended March 3, 1935, cases of certain communicable diseases were reported in Italy as follows:

Disease	Feb. 4-10		Feb. 11-17		Feb. 18-24		Feb. 25-Mar. 3	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	19	19	8	8	19	18	7	7
Cerebrospinal meningitis	26	15	25	23	18	14	32	23
Chicken pox	333	118	415	143	364	119	407	141
Diphtheria and croup	628	319	700	354	486	246	559	315
Dysentery	4	3	5	4	3	3	5	5
Lethargic encephalitis	1	1	1	1			5	5
Measles	2,920	346	3,347	361	3,059	332	2,616	352
Poliomyelitis	6	6	8	8	10	10	4	4
Scarlet fever	409	144	351	120	283	108	277	100
Typhoid fever	216	138	216	129	164	115	196	121

SPAIN

Vital statistics—1934.—The following table shows the number of births and deaths, together with death rates from certain causes, reported in Spain during 1934.

Population, estimated Dec. 31, 1933	21,242,038
Number of deaths	388,221
Death rate per 1,000 population	16.01
Number of births	637,416
Birth rate per 1,000 population	26.30
Stillbirths	21,104
Deaths under 1 year of age	72,027
Death rates per 100,000 population from—	
Bronchitis	70.5
Diarrhea and enteritis	188.5
Death rates per 100,000 population from—Continued.	
Diphtheria	5.2
Measles	13.7
Pneumonia	158.4
Scarlet fever	2.4
Tuberculosis, pulmonary	88.4
Tuberculosis, other forms	23.1
Typhoid and paratyphoid fever	12.8
Whooping cough	4.2

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Apr. 26, 1935, pp. 580–594. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued May 31, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Plague

Egypt—Alexandria.—On May 7, 1935, 1 case of bubonic plague was reported at Alexandria, Egypt.

Hawaii Territory—Hawaii Island—Hamakua District.—On May 8, 1935, 1 plague-infected rat was found in Hamakua District, Hawaii Island, Hawaii Territory.

Indo-China—Saigon-Cholon.—During the week ended May 4, 1935, 1 case of plague was reported at Saigon-Cholon, Indo-China.

Iraq.—During the week ended May 4, 1935, plague was reported in Iraq, as follows: 1 case at Baghdad, and 1 case in Baghdad Province, Iraq.

United States—California.—A report of plague-infected ground squirrels in California appears on page 718 of the this issue of Public Health Reports.

Smallpox

British Guiana.—A small outbreak of a mild form of smallpox was reported May 3, 1935, at Mabaruma in the northwest district of the colony of Essequibo approximately 100 miles northwest of Georgetown, British Guiana. All cases have been isolated and the district quarantined.

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UNITED STATES PUBLIC HEALTH SERVICE

Hugh S. Cumming, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. Williams, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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PREVENTION OF INTRANASALLY-INOCULATED POLIOMYELITIS OF MONKEYS BY INSTILLATION OF ALUM INTO THE NOSTRILS

By CHARLES ARMSTRONG and W. T. HARRISON, *Surgeons, United States Public Health Service* *

Various agents have been reported as exerting a local influence upon the susceptibility of tissues to various viruses, such as those of vaccinia, encephalitis (St. Louis type), and equine encephalomyelitis, by Ledingham (*1*), Carnot and his coworkers (*2*), Le Fevre (*3*), Rivers (*4*), Armstrong (*5*, *6*), Olitsky and Cox (*7*), and others. In view of considerations which indicate that the nasal mucous membranes constitute one, and perhaps the most usual, natural route of infection in poliomyelitis, it was deemed desirable to determine whether the mucous membrane of the nose of monkeys could be rendered less permeable to poliomyelitis virus through treatment with solutions of sodium aluminum sulphate, which have been shown to render mice increasingly resistant to the intranasal administration of encephalitis virus (St. Louis type) (*6*).

EXPERIMENTAL METHOD

Fresh *Rhesus* monkeys, distributed as to weight, were given identical care and treatment except that the test animals received instillations of 1.5 cc of a 4 percent sodium aluminum sulphate solution into each nostril, at varying times relative to the virus inoculations, by means of a tuberculin syringe from which the needle had been removed,[1] while the control animals received either 1.5 cc of normal sodium chloride solution or, in most instances, no treatment whatever (table 1).

Virus for each test was prepared by grinding portions of cords from several animals which had recently died of poliomyelitis and diluting to the desired concentration with 0.85 percent sodium chloride solution. Centrifugation was carried out at slow speed to remove gross particles and the supernatant fluid used for intranasal inoculation. Concentrations of 2.5, 4, and 5 percent were employed in different tests, three inoculations of 1 cc of the appropriate suspension being administered into each nostril at intervals of 24 hours (table 1).

* From the National Institute of Health, Washington, D. C.

[1] Gentian violet similarly introduced was found, through frozen preparations, to stain the entire nasal membranes.

TABLE 1.—*Details of tests*

Monkey no.	Intranasal preparation and inoculation							Day of complete paralysis following first intranasal virus inoculation			Onset of fever by days following first virus inoculation		Remarks
								Alum-prepared monkeys	Saline-prepared monkeys	Controls	Alum-prepared monkeys	Control monkeys	
					1/22/35	1/23/35	1/24/35						V=1 cc 5 percent polio cords each nostril.
899	A 12 doses of alum, 12/27/34 to 1/21/35				V	V	V	S					
873					V	V	V	S					
903					V	V	V			9		5	
887					V	V	V			9		5	
				2/4/35	2/5/35	2/6/35	2/7/35						V=1 cc 2 5 percent polio cords each nostril
894				A	AV	AV	AV	S					
895				A	AV	AV	AV	S					
		2/2/35	2/3/35	2/4/35	2/5/35	2/6/35	2/7/35						
897		A	A	A	V	V	V	*6					
893		A	A	A	V	V	V	S					
		1/30/35	1/31/35	2/4/35	2/5/35	2/6/35	2/7/35						
905		A	A	A	V	V	V	S					
904		A	A	A	V	V	V	●S					
					2/5/35	2/6/35	2/7/35						
902					V	V	V			S			
901					V	V	V			10		6	
	2/24/35	2/25/35	2/26/35	2/27/35	2/28/35	3/1/35	3/2/35						V=1 cc 5 percent polio cords each nostril.
919	A	A	A	AV	AV	AV	A	S					
918	A	A	A	AV	AV	AV	A	S					
917	A	A	A	AV	AV	AV	A	S					
916	A	A	A	AV	AV	AV	A	S					
	2/18/35	2/22/35	2/26/35	2/27/35	2/28/35	3/1/35	3/2/35						

911	A	A	A	V	V	V	A	S					
910	A	A	A	V	V	V	A	S					
909	A	A	A	V	V	V	A	12			5		
908	A	A	A	V	V	V	A	S					
				2/27/35	2/28/35	3/1/35							
915				V	V	V				S			
914				V	V	V				S			
913				V	V	V				9		5	
912				V	V	V				9		4	
	3/31/35	4/1/35	4/2/35	4/3/35	4/4/35	4/5/35	4/6/35						
935	A	A	A	AV	AV	AV	A	12			6		V=1 cc 5 percent polio cords each nostril.
934	A	A	A	AV	AV	AV	A	24			5		
933	A	A	A	AV	AV	AV	A	15			10		
932	A	A	A	AV	AV	AV	A	12			7		
927	S′	S′	S′	S′V	S′V	S′V	S′		9			4	
926	S′	S′	S′	S′V	S′V	S′V	S′		11			5	
925	S′	S′	S′	S′V	S′V	S′V	S′		S			3	
924	S′	S′	S′	S′V	S′V	S′V	S′		11			6	
931				V	V	V				9		4	
930				V	V	V				10		5	
929				V	V	V				9		4	
928				V	V	V				9		4	
		4/19/35	4/20/35	4/21/35	4/24/35	4/25/35	4/26/35						V=1 cc 4 percent polio cords each nostril.
951					AV	AV	AV	S					
941		A	A	A	AV	AV	AV	S					
939		A	A	A	AV	AV	AV	S					
938		A	A	A	AV	AV	AV	13			7		
942					V	V	V			14		6	
943					V	V	V			11		5	
944					V	V	V			*5			
945					V	V	V			10		6	

A=Alum, 1.5 cc into each nostril.
V=Virus, 1 cc into each nostril.
AV=Alum, 1.5 cc in morning, virus in afternoon.
S′=Saline (0.85 percent), 1.5 cc into each nostril.
S′V=Saline (0.85 percent), 1.5 cc morning, virus in afternoon.
S=Survived.
*=Death not due to poliomyelitis.
●=Died on 26th day after inoculation of septicaemia; no poliomyelitis.

Temperatures were taken daily. Animals which developed poliomyelitis were allowed to go until complete paralysis developed, when they were etherized and autopsy was performed, and tissues were submitted for pathological confirmation as to cause of death.

RESULTS

One prepared and one control animal died of causes other than poliomyelitis 6 and 5 days, respectively, following their first virus inoculation. Among the remaining 23 alum-prepared animals 17 survived the virus inoculations, while among 19 control monkeys there were but 3 survivals, or 74 and 16 percent, respectively (table 2).

TABLE 2.—*Summary of results*

	Total number of monkeys	Monkeys dead of poliomyelitis	Monkeys dead of other causes (excluded)	Survived poliomyelitis inoculations	Average number of days, first inoculation to complete paralysis	Average number of days, first inoculation to onset fever	Average number of days of illness	Percent survived
Alum-prepared	21	6	1	17	$14\frac{3}{5}$	$6\frac{3}{5}$	8	74
Controls	20	16	1	3	$9\frac{9}{10}$	$4\frac{13}{16}$	5	16

In some of our tests (table 1) the alum administrations varied in their time relationship to the virus instillations, and so in certain instances one group of animals was permitted to serve as controls for more than one test group; consequently the controls and test groups of animals were not exactly equal in number. In view of the fact that the virus dosage varied in different tests, it appears that this variation in the number of monkeys in the two groups in some instances tended to favor the test groups; for, if we render the test and control groups of monkeys equal in each test, by supplying animals and attributing the same incidence of poliomyelitis to these theoretical groups as developed in the actual groups which were duplicated, it is found that 63 percent of the alum-prepared animals would have lived as compared with 24 percent for the controls (27 animals each group).

In addition to their higher survival rate, the alum-prepared animals which developed poliomyelitis tended to develop the disease later and the ailment tended to run a slower course than was the case in the control groups. For instance, the average interval from the first intranasal virus inoculation to onset of fever (40° C.+) in the prepared animals which died of poliomyelitis was $6\frac{3}{5}$ days as compared with $4\frac{13}{16}$ days for the control groups. The average interval from first virus inoculation to complete paralysis in the two groups was $14\frac{3}{5}$ days and $9\frac{9}{10}$ days, respectively.

Among the 17 survivals from the alum-prepared group there were 8 monkeys which ran a course of fever, beginning from 5 to 21 days

following the first inoculation and lasting from 6 to 13 days, which seemed probably due to poliomyelitis (table 3). Monkey 951 developed partial paralysis in the hind legs; the others showed no detectable crippling. The three survivals from the control group developed no febrile response.

TABLE 3.—*Surviving animals that developed fever but recovered*

Monkey no.	Interval from first inoculation to onset fever	Duration of fever	Remarks
	Days	*Days*	
873	19	6	Complete recovery.
899	20	6	Do
895	17	7	Do
911	13	12	Do
918	21	8	Do
919	11	6	Do
941	5	6	Do
951	9	13	Developed partial paralysis hind legs.
Average	14⅜	8	

IMMUNITY

The fact that there were 8 alum-prepared animals which developed fever but survived, while in the control group all those developing fever went on to complete paralysis, together with the fact that among the group which died the alum-prepared animals tended to develop symptoms later and to live longer than the controls, led us to feel that the alum-treated surviving animals might tend to develop a specific immunity. This result had been previously shown for alum-prepared white mice inoculated intranasally with the virus of encephalitis (St. Louis type) (Armstrong *(8)*).

Seven surviving animals were consequently inoculated intracerebrally with what was estimated to be about 10 minimal infectious doses of poliomyelitis virus. Four of these 7 animals and one of the control group of 2 animals withstood the inoculation. Thus no obvious increase of immunity was apparent from this test. The sera from surviving animals have not been tested for protective properties. After sufficient time has elapsed to allow the mucous membranes of other surviving animals to return to normal, it is planned to retest them by the intranasal route, as it is felt that this is a more practical test for immunity in such animals.

ACTION OF ALUM

The mechanism by which alum exerts its protective effect against poliomyelitis is not definitely determined; however, it has been shown *(5)* that diphtheria toxin exerted a local inhibitory action against vaccine virus through the cellular response which it engendered. Since 6 alum-prepared monkeys died of poliomyelitis while

8 ran a fever but recovered, and since animals in which the virus inoculations followed the last alum instillation by 24, 48, and 72 hours survived in excess of the controls, it is indicated that the protection is probably not due to an antiseptic action of the alum.

The authors have sprayed a 1-percent alum solution into their nostrils on 3 successive days. The treatment produced some temporary tickling and stinging which resulted in an occasional sneeze, and there was increased secretion for perhaps an hour, followed by a feeling of dryness which disappeared after several hours.

The search in mice for solutions more protective than alum against the virus of encephalitis (St. Louis type) is being continued and preliminary results indicate that such solutions exist. These tests, if confirmed, will be applied to poliomyelitis in monkeys.

The results here reported are not recommended for human use, but offer a hopeful avenue of approach which may lead to effective methods against poliomyelitis and possibly against other diseases contracted by way of the nasal mucous membranes.

SUMMARY

1. The instillation of sodium aluminum sulphate, 4 percent, into the nostrils of monkeys resulted in the survival of 17 from a group of 23 animals, while only 3 from a group of 19 nonprepared controls survived similar intranasal inoculation with poliomyelitis virus.

2. Poliomyelitis tended to develop later and to run a slower course in the alum-prepared group than in the nonprepared controls.

3. The protective action of the alum solution is believed to be due to an alteration which decreases the permeability of the mucous membrane of the nose rather than to an antiseptic action.

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TULARAEMIA

Susceptibility of the White-tailed Prairie Dog, *Cynomys leucurus* Merriam[1]

By Gordon E. Davis, *Bacteriologist, United States Public Health Service, Rocky Mountain Laboratory, Hamilton, Mont.*

During the latter part of May 1933, 7 white-tailed prairie dogs (3 adult females, 1 adult male, and 3 young animals), captured in northwestern Colorado, were brought to the Rocky Mountain Laboratory to be tested for susceptibility to tularaemia. On June 9 each animal was injected subcutaneously with 0.0000002 cc of a 500 turbidity suspension of *Bacterium tularense*. Two domestic rabbits and two guinea pigs each received the same dose, administered in the same manner. Since the prairie dogs were infested with lice, they were placed in cloth bags.

Six days following the injection the adult male, 1 female and 2 of the young dogs were found dead. In each case the spleen, liver, and inguinal lymph nodes were suggestive of tularaemia. Blood-stained fluid was present in the abdominal cavity. As this was a period of extreme heat, the *post mortem* changes were so marked that no cultures were attempted. The remaining 2 adult females and the single remaining young one were definitely ill and were bled for culture. Two days later these prairie dogs also died, and each showed numerous discrete white foci in the liver and spleen. The peritoneal cavity of the young prairie dog contained a large amount of clear fluid. A pure culture of *Bact. tularense* was recovered from the heart blood of this animal. Cultures from the other prairie dogs showed typical *tularense* colonies but were overgrown by a mold.

Six sucking lice (*Neohaematopinus laeviusculus* (Grube))[2], recovered from the bags in which the prairie dogs had been placed, were ground in saline and injected intraperitoneally into a guinea pig. This guinea pig died on the fifth day of typical tularaemia, and a pure culture of *Bact. tularense* was recovered from the heart blood.

The control rabbits and guinea pigs died of typical acute tularaemia, the former on the sixth and seventh days, respectively, and both the latter on the fifth day. A pure culture of *Bact. tularense* was recovered from the heart blood of one rabbit. Cultures from the other control animals were not attempted.

SUMMARY

Seven prairie dogs, 4 adults and 3 young, when injected with *Bact. tularense*, died showing gross lesions suggestive or typical of acute tularaemia, and a pure culture of the organism was isolated from the

[1] Contribution from the Rocky Mountain Laboratory, United States Public Health Service, Hamilton, Mont.

[2] Determination was made by Assistant Bacteriologist W. L. Jellison, of the Rocky Mountain Laboratory.

heart blood of one shortly before death The specific organism was also isolated from the guinea pig injected with lice which had fed on the infected prairie dogs

USE OF BELOW-FREEZING TEMPERATURES FOR MAINTENANCE OF MENINGOCOCCUS CULTURES (*Neisseria intracellularis* Weichselbaum)

By ANNA M PABST, *Junior Bacteriologist, United States Public Health Service National Institute of Health*

This paper reports the preservation of meningococci by simple storage in pure undiluted neutral glycerin at −15° C.

It has long been known that below-freezing temperatures are not necessarily destructive to the viability of pathogenic organisms. Numerous reports have been made of the tolerance to cold of viruses, yeasts, and the hardier bacteria, but few investigations have been reported of the tolerance of meningococci to cold; in fact the literature is full of statements that meningococci are easily killed by low temperatures.

Meningococci are undoubtedly delicate microorganisms and often difficult to maintain in stock cultures. It is generally stated that the optimum temperature requirements of these organisms lie between 36° and 38° C., though most workers are agreed that the tolerance range extends much farther below than above the optimum. Many authors (*1–5*) have reported that meningococcus cultures remained alive in the refrigerator (6° to 8° C.) from 3 days to a week. Bettencourt and Franca (*6*) have reported the survival of some strains in the refrigerator for a month. Flexner (*7*) placed cultures in the refrigerator, not only at 2° above freezing, but also at 5° below freezing. He observed that thick suspensions in salt solution survived for 5 days. At the same time, his report that such saline solution is somewhat injurious to meningococci suggested the importance of the menstruum used.

Other authors have reported storage of meningococci at temperatures lower than those just cited. Von Lingelsheim (*1*), in 1906, observed the survival of meningococci at −10° and −20° C. for short periods. Murray (*9*) scraped the growth from agar plates, smeared it on the walls of tubes, and subjected these to temperatures of −63° and −78° C. for 15 to 20 minutes. He obtained good rapid growth on subsequent subculture. Elser and Huntoon (*8*) later reported that "meningococci may remain alive for years if dried rapidly under freezing temperatures and kept frozen." Their work was done according to the method originally described by Shackell (*10*), in which the material was frozen and then dehydrated in vacuum, a method later used by Rogers (*11*) in preserving mass cultures of lactic acid-forming

bacilli, as well as by Hammer (*12*), and Shattock and Dudgeon (*13*). Swift (*14*) made special application of this desiccation-after-freezing method to the preservation of meningococci, and he has reported viability after a period of at least 2 months. Reichel (*15*) has more recently used this method with some modifications and has found meningococci viable after a period of at least 6 months. During the preparation of the author's report, Rake (*16*) has described the preservation of meningococci for several months by a different technique of freezing and drying. Other authors (*17*, *18*) have reported viability of bacteria other than meningococci when stored at temperatures considerably below freezing, without desiccation.

Recently, Francis (*19*) has reported the maintenance of virulence of *B. pestis* in a guinea pig spleen when suspended in pure undiluted neutral glycerin at −15° C. for 7 years; and also its survival in pure culture when suspended in undiluted neutral glycerin for a period of 2 years and 7 months. He has also found that *B. tularense* maintained its virulence in infected guinea pig spleens which had been suspended in pure glycerin at −15° C. for 6½ years. *B. tularense* in frozen rabbit tissue, not suspended in glycerin but stored at −15° C., was virulent for 6 to 36 months (depending on the tissue involved), whereas the pure culture growth when scraped off and suspended in glycerin at −15° C. was found viable after 2½ years.

It was decided to apply the simple method reported by Francis to an investigation of the survival of meningococci when stored in pure undiluted neutral glycerin at −15° C. In making this study, 10 strains, representing different serological groups and various periods of laboratory maintenance, were chosen from a large stock collection of meningococci. Four of these, nos. 123, 55, 57, and 60, were very old strains which had originally been received from the Rockefeller collection in 1916. They had been carried on artificial media for over 16 years and had been used for a long time as the 4 standard type strains representing the Gordon-Murray groups of meningococci. The other 6 varied in age from 2 months to 3 years. Four of them, nos. 331, 173, 302, and 158, were recently chosen as the strains representing most nearly the 4 meningococcus type strains described by Gordon and Murray; the other 2 strains, nos. 198 and 479, had been found especially suitable for the preparation of toxic filtrates by the method of Ferry (*20*). It was particularly interesting to use strain 302 in this study, because it had been especially difficult to cultivate on laboratory media.

These strains were planted on glucose agar slants and incubated at 36.5° C. for 24 hours. Sixteen well-grown, 24-hour cultures were made from each strain. They were divided into 2 groups of 8. In group A, the growth was scraped off the slants, and suspended in small vials of glycerin, and the vials were tightly stoppered and

immediately stored at $-15°$ C. In group B, glycerin was poured over the growth on the entire slant. The tubes were tightly stoppered and immediately stored at $-15°$ C. After a period of 2 months, 1 tube and 1 vial of each strain were taken out of storage and transfers were made to freshly prepared glucose agar slants and blood agar slants. After incubation at 36.5° C., the cultures were examined. Every culture was found to grow well. Similar tests were made after periods of 3 months, 6 months, 12 months, 18 months, and 24 months. In each instance viability was demonstrated by transfer to glucose agar slants. After the 2-year period, the transplants grew more slowly and the growth seemed more delicate than previously. In a few instances it was necessary to make cultures from two vials, or tubes, before obtaining growth. Morphologically, the organisms appeared unchanged in size, shape, and grouping. Their staining reactions were normal.

After storage for 2 years under these conditions it was decided to study these strains serologically and biochemically. Table 1 is a report of the agglutination reactions of these strains with monovalent sera before and after the 2-year storage. It indicates that the serological characteristics have remained unchanged. Table 2 shows the fermentation reactions before and after the 2-year storage period.

TABLE 1.—*Serological reactions of 10 strains of meningococci before and after 2 years' storage at $-15°$ C*

BEFORE STORAGE

Antigen	Serum 331 (I)	Serum 173 (II)	Serum 302 (III)	Serum 158 (IV)	Serum 123 (I)	Serum 55 (II)	Serum 57 (III)	Serum 60 (IV)
331 (I)	444443	000000	431100	000000	443100	000000	321000	000000
173 (II)	110000	444421	000000	000000	321000	431100	211000	000000
302 (III)	432100	000000	441431	000000	433221	211000	321000	000000
158 (IV)	000000	000000	000000	442200	000000	000000	000000	442100
123 (I)	443321	210000	444442	000000	444322	322100	413200	000000
55 (II)	000000	432100	222100	100000	110000	444321	110000	000000
57 (III)	433321	000000	333332	000000	442211	321100	433221	000000
60 (IV)	000000	100000	000000	412100	000000	000000	000000	413300
198 (I)	441300	000000	132100	000000	413100	221100	211000	000000
479 (III)	000000	000000	433200	000000	---	-	--	---

AFTER STORAGE

Antigen	Serum 331 (I)	Serum 173 (II)	Serum 302 (III)	Serum 158 (IV)	Serum 123 (I)	Serum 55 (II)	Serum 57 (III)	Serum 60 (IV)
331 (I)	444310	110000	110000	000000	432100	100000	110000	000000
173 (II)	000000	444321	000000	000000	000000	432100	000000	000000
302 (III)	110000	100000	414310	000000	332200	210000	432100	000000
158 (IV)	000000	000000	000000	443210	100000	000000	000000	433100
123 (I)	333100	210000	321100	000000	432100	110000	321000	000000
55 (II)	000000	442100	000000	000000	100000	443200	100000	000000
57 (III)	000000	111100	431000	000000	321000	431100	444310	000000
60 (IV)	000000	000000	000000	441000	000000	000000	000000	431000
198 (I)	442100	000000	310000	000000	331100	431000	211000	000000
479 (III)	000000	000000	443110	000000	211000	000000	333200	000000

NOTE.—Above agglutinations were made with serum dilutions in series of 1:50, 1:100, 1.200, 1:400, 1:800, and 1:1600.

0=no agglutination.

1, 2, 3 = varying degrees of agglutination.

4=complete agglutination.

TABLE 2.—*Sugar fermentation by 10 strains of meningococci before and after storage at —15° C. for 2 years*

Number of strain	Before storage at —15° C.				After storage at —15° C.			
	Dextrose	Levulose	Maltose	Saccharose	Dextrose	Levulose	Maltose	Saccharose
331	+	—	+	—	+	—	+	—
173	+	—	+	—	+	—	+	—
302	+	—	+	—	+	—	+	—
158	+	sl	+	—	+	—	+	—
123	+	—	+	—	+	—	+	—
55	sl	—	sl	—	+	—	+	—
57	+	—	sl	—	+	—	+	—
60	+	—	+	—	+	—	+	—
198	+	—	+	—	+	—	+	—
479	+	—	+	—	+	—	+	—

These studies show that the viability of these 10 meningococcus strains was maintained by storage in pure, undiluted, neutral glycerin at —15° C. for a period of 2 years, with no demonstrable change in morphology or in biochemical or serological reactions.

After these 10 strains of meningococci had been in storage for more than a year it was decided to store all 223 cultures of our stock collection at —15° C. Three sets of transplants were prepared—1 set on 0.15 percent semisolid agar and 2 sets on glucose agar slants. These were all incubated at 37° C. for 24 hours. One set of the glucose agar slant cultures (set C) was then prepared as in group B described above (glycerin poured over the slant to cover the entire growth). Set D (glucose agar slants) and set E (the 0.15 percent semisolid agar) were prepared for storage without the addition of glycerin or any other agent. They were all tightly stoppered and stored at — 15° C.

After 8 months' storage these cultures were tested for viability. Transfers to glucose agar slants and to blood agar slants were made immediately after removal from the freezing compartment *before the culture had thawed out.* When transferring from a slant culture to which no glycerin had been added it was usually necessary to lift a small frozen block of culture from the top of the slant and transfer it to the new fresh slant.

After transplanting all three sets it was found that 92.8 percent of the strains were viable after 8 months' storage at —15° C. Most of these were recovered from the glucose agar slant cultures; very few were from the 0.15 percent semisolid agar cultures.

It is interesting to note that the percentage of cultures recovered from set D (glucose agar slants stored without the addition of glycerin) was similar to the percentage of cultures recovered from set C (glucose agar slants covered with glycerin). Set D appeared to be in as good condition as set C and equal in viability after the 8 months' storage. It therefore appears that the addition of glycerin is unnecessary for the preservation of meningococci at —15° C. for 8 months.

Its effect, however, on the ultimate longevity of this organism has not been determined.

On the other hand, very few strains were recovered from the 0.15 percent semisolid agar cultures (set E). As reported above, these cultures had been made at the same time and under the same conditions as cultures in sets C and D. They had been transplanted from the same parent cultures, had been incubated for 24 hours and then stored in the $-15°$ C. compartment at the same time. The only difference lay in the media. This observation is in accord with the observation of Flexner (*7*) and of Elser and Huntoon (*21*) that viability of organisms at low temperatures is influenced by the menstruum used. Murray (*9*) has called attention to the importance of the medium used, not only during the cold-storage period, but also used for recovering the strain after removal from the freezing compartment. Murray (*9*) and Swift (*14*) both endorse the use of freshly prepared blood agar for this purpose. Otten (*22*) stresses the need of a "favorable medium, especially the blood-agar plate, to bring the organism to development from its latent life."

In recovering the meningococcus after storage at $-15°$ C. at this laboratory, it has appeared that glucose agar and blood agar were equally favorable, provided they were freshly prepared. Further studies are being made on this point.

From the above reported studies it appears that the meningococcus may be preserved in pure, undiluted, neutral glycerin at $-15°$ C. for at least 2 years. It also appears that the meningococcus may be preserved equally well when stored at $-15°$ C. in pure culture form without the addition of glycerin for a period of 8 months, which is the longest period of observation to date.

Our results indicate, in part, that preservation of meningococci at $-15°$ C. is not only a question of temperature but is influenced by age and condition of culture when stored, medium used during storage period, and medium used for recovery of cultures. The prompt placing of cultures directly in the $-15°$ C. compartment as well as the prompt transplanting of cultures after removal from the below-freezing compartment appear to be essential to the successful recovery of meningococci after cold storage.

In making these studies, it has not been possible to test for maintenance of virulence, since all strains had become avirulent before the experiments began.

This method is presented because of its relative simplicity and its apparent efficiency in maintaining large stock collections of meningococci over long periods of time. Every bacteriologist knows how great is the expenditure of time, labor, and materials in maintaining large stock collections of meningococci by frequent transfers, and of the dangers of contamination or degeneration or sudden loss of strains.

The use of below-freezing temperatures, under controlled conditions, seems to offer a means of preserving unchanged the delicate meningococcus over long periods of time.

SUMMARY

Ten chosen strains of meningococci have been stored in neutral glycerin at −15° C. for 2 years with no apparent change in viability, in morphology, or in serological or biochemical characteristics. Two hundred and twenty-three strains have been stored at this temperature on glucose agar slants, both with and without glycerin, with no appreciable loss of viability in the 8 months during which they have been under observation.

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DEATHS DURING WEEK ENDED MAY 11, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended May 11, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	8,582	8,490
Deaths per 1,000 population, annual basis	12.0	11.8
Deaths under 1 year of age	587	639
Deaths under 1 year of age per 1,000 estimated live births	54	50
Deaths per 1,000 population, annual basis, first 19 weeks of year	12.6	12.5
Data from industrial insurance companies:		
Policies in force	67,734,320	67,788,001
Number of death claims	12,858	13,538
Death claims per 1,000 policies in force, annual rate	9.9	10.4
Death claims per 1,000 policies, first 19 weeks of year, annual rate	10.7	11.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for weeks ended May 18, 1935, and May 19, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 18, 1935, and May 19, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 18, 1935	Week ended May 19, 1934	Week ended May 18, 1935	Week ended May 19, 1934	Week ended May 18, 1935	Week ended May 19, 1934	Week ended May 18, 1935	Week ended May 19, 1934
New England States:								
Maine	5	1	2	1	178	10	0	0
New Hampshire					5	79	0	0
Vermont					49	65	0	0
Massachusetts	4	11			423	1,251	0	0
Rhode Island	2				498	14	0	0
Connecticut	2	3		1	1,202	156	1	1
Middle Atlantic States:								
New York	39	56	[1] 8	[1] 6	2,876	1,089	35	2
New Jersey	30	15	11	27	2,166	817	3	1
Pennsylvania	23	61			3,438	4,011	2	4
East North Central States:								
Ohio	35	12	73	10	2,056	1,689	10	6
Indiana	20	9	14	12	229	1,301	6	1
Illinois	42	33	47	21	1,861	2,316	24	4
Michigan	11	14	1	2	4,217	322	0	2
Wisconsin	2	1	89	30	1,505	2,931	1	1
West North Central States:								
Minnesota	12	7	2	1	520	310	0	0
Iowa	0	11	8		331	368	2	3
Missouri	25	21	37	31	418	520	20	4
North Dakota	4	2			15	122	0	0
South Dakota		3			37	362	0	0
Nebraska	5	9			295	286	2	0
Kansas	6	8	4	2	821	611	1	0
South Atlantic States:								
Delaware	2	1			6	95	0	0
Maryland [2 3]	6	4	8	4	73	2,275	9	0
District of Columbia	10	2		1	40	75	8	0
Virginia [3]	18	18			506	1,375	23	0
West Virginia	13	6	12	18	384	154	4	3
North Carolina [4]	23	15	9	11	150	1,223	3	1
South Carolina	2	1	72	158	13	300	0	0
Georgia [4]	3	5				385	1	0
Florida	2	3	3		23	320	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 18, 1935, and May 19, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 18, 1935	Week ended May 19, 1934	Week ended May 18, 1935	Week ended May 19, 1934	Week ended May 18, 1935	Week ended May 19, 1934	Week ended May 18, 1935	Week ended May 19, 1934
East South Central States:								
Kentucky	7	4	24	8	283	369	2	0
Tennessee	6	3	18	54	18	220	7	5
Alabama [4]	8	3	26	20	122	834	0	1
Mississippi [2]	6	4					0	1
West South Central States:								
Arkansas	8	5	37	6	73	54	0	1
Louisiana [4]	17	14	6	6	56	205	1	0
Oklahoma [5]	2	6	65	26	67	175	1	1
Texas [4]	35	39	86	115	117	530	3	0
Mountain States:								
Montana [3]	5	2	45	6	502	97	0	1
Idaho [3]		1	3		2	34	1	0
Wyoming [3]		1			23	91	0	0
Colorado	8	6			405	590	0	0
New Mexico	1	2	9		9	164	0	0
Arizona	9	1	8	2	13	17	0	0
Utah [2]	1	2			1	83	0	0
Pacific States:								
Washington	7	4			524	132	2	1
Oregon [3]	3		15	24	210	75	2	0
California	24	34	47	26	1,714	746	5	0
Total	502	463	789	638	28,603	20,434	179	44
First 20 weeks of year	13,029	15,211	90,537	44,166	550,132	533,467	2,843	1,123

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 18, 1935	Week ended May 19, 1934	Week ended May 18, 1935	Week ended May 19, 1934	Week ended May 18, 1935	Week ended May 19, 1934	Week ended May 18, 1935	Week ended May 19, 1934
New England States:								
Maine	0	0	9	13	0	0	1	4
New Hampshire	0	0	17	15	0	0	0	0
Vermont	0	0	2	11	0	0	1	3
Massachusetts	0	0	210	261	0	0	4	3
Rhode Island	0	0	19	18	0	0	0	0
Connecticut	0	0	101	59	0	0	1	1
Middle Atlantic States:								
New York	1	0	1,020	701	0	0	8	7
New Jersey	0	0	179	186	0	0	1	2
Pennsylvania	0	1	508	617	0	0	10	4
East North Central States:								
Ohio	0	0	638	478	0	0	7	5
Indiana	0	0	96	92	2	1	3	6
Illinois	0	0	1,131	544	2	1	7	5
Michigan	0	1	[illegible]	801	0	1	3	2
Wisconsin	1	0	407	741	17	21	1	1
West North Central States:								
Minnesota	0	0	364	65	3	7	1	2
Iowa	1	1	79	56	10	9	1	1
Missouri	0	0	34	55	4	16	5	17
North Dakota	0	0	43	58	1	2	0	0
South Dakota	0	0	25	13	2	1	0	0
Nebraska	0	0	56	26	17	9	0	0
Kansas	0	0	44	35	18	4	3	2
South Atlantic States:								
Delaware	0	0	10	3	0	0	0	0
Maryland [2] [3]	0	0	103	50	0	0	5	10
District of Columbia	0	0	43	17	0	0	0	2
Virginia [3]	1	0	17	25	0	0	2	5
West Virginia	0	0	62	93	0	2	11	3
North Carolina [4]	2	0	17	17	0	0	1	1
South Carolina	0	0	3	2	0	0	12	16
Georgia [4]	0	0	[illegible]	4	0	0	14	20
Florida	1	0	1		0	0	6	8

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 18, 1935, and May 19, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 18, 1935	Week ended May 19, 1934	Week ended May 18, 1935	Week ended May 19, 1934	Week ended May 18, 1935	Week ended May 19, 1934	Week ended May 18, 1935	Week ended May 19, 1934
East South Central States:								
Kentucky	0	0	21	31	0	0	8	5
Tennessee	1	0	16	15	0	0	3	4
Alabama [4]	0	0	7	9	3	0	6	6
Mississippi [2]	0	0	7	-------	0	0	3	5
West South Central States:								
Arkansas	0	1	4	3	5	8	4	1
Louisiana [4]	4	0	2	10	0	1	13	10
Oklahoma [5]	1	0	6	2	0	4	0	1
Texas [4]	1	1	28	38	8	47	22	8
Mountain States:								
Montana [3]	0	0	6	3	8	2	1	0
Idaho [3]	0	2	8	1	0	1	0	0
Wyoming [3]	0	0	15	17	2	0	2	1
Colorado	0	0	167	23	0	1	1	0
New Mexico	0	0	5	14	0	0	3	2
Arizona	0	2	24	7	0	0	3	0
Utah [2]	0	0	131	7	0	1	0	0
Pacific States:								
Washington	2	1	48	56	34	0	1	3
Oregon [3]	0	0	15	32	8	0	5	4
California	3	36	241	180	11	1	9	18
Total	19	46	6,452	5,597	155	140	192	202
First 20 weeks of year	478	474	142,869	119,493	3,778	3,028	2,732	3,236

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Rocky Mountain spotted fever, week ended May 18, 1935, 11 cases, as follows: Maryland, 1; Virginia, 2; Montana, 3; Idaho, 2; Wyoming, 1; Oregon, 2.
[4] Typhus fever, week ended May 18, 1935, 23 cases, as follows: North Carolina, 4; Georgia, 4; Alabama, 4; Louisiana, 2; Texas, 9.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
April 1935										
Georgia	1	17	189	116	131	29	2	21	4	30
Idaho	1	1	19	-------	105	-------	0	25	2	2
Illinois	88	104	178	7	12,581	-------	3	5,574	1	38
Iowa	16	45	15	-------	3,393	-------	0	370	22	3
Maryland	5	18	38	-------	303	-------	1	520	0	15
Michigan	13	43	8	2	25,808	-------	4	1,507	1	17
Minnesota	6	40	7	-------	2,604	-------	4	1,488	25	9
New Jersey	11	70	55	1	7,412	-------	5	799	0	6
New Mexico	2	18	43	1	144	2	2	66	14	10
Ohio	77	183	250	-------	9,129	-------	1	3,550	5	18
Oregon	9	15	171	-------	951	-------	0	226	11	4
Rhode Island	4	3	-------	-------	1,193	-------	0	40	0	2
South Carolina	2	64	963	477	196	99	0	25	0	11
South Dakota	1	12	45	-------	262	-------	0	64	55	0
Texas	11	160	1,254	838	822	44	5	229	126	49
West Virginia	15	55	195	-------	1,726	-------	0	277	0	26

April 1935

Disease and State	Cases
Anthrax:	
Georgia	1
Chicken pox:	
Georgia	235
Idaho	14
Illinois	1,746
Iowa	254
Maryland	704
Michigan	1,625
Minnesota	463
New Jersey	2,369
New Mexico	94
Ohio	2,120
Oregon	251
Rhode Island	102
South Carolina	103
South Dakota	34
Texas	822
West Virginia	119
Conjunctivitis:	
New Mexico	1
Dengue:	
Texas	6
Diarrhea:	
Maryland	8
South Carolina	309
Ohio (under 2 years)	8
Dysentery:	
Georgia (amoebic)	5
Georgia (bacillary)	19
Illinois (amoebic)	7
Illinois (amoebic carriers)	25
Iowa (bacillary)	1
Maryland (bacillary)	3
Michigan (amoebic)	4
Michigan (bacillary)	1
New Jersey (unspecified)	1
New Jersey (amoebic)	3
New Jersey (bacillary)	1
New Mexico (amoebic)	1
Ohio (amoebic)	2
Texas	60
Epidemic encephalitis:	
Illinois	18
Iowa	1
Michigan	3
Minnesota	1
New Jersey	5
Ohio	5
Oregon	1
South Carolina	6
Texas	4
Food poisoning:	
Ohio	12
German measles:	
Illinois	5,210
Iowa	479
Maryland	434
New Jersey	2,530
New Mexico	94
Ohio	4,104
Rhode Island	20
Hookworm disease:	
Georgia	692
South Carolina	78

April 1935—Continued

Disease and State	Cases
Impetigo contagiosa:	
Illinois	1
Maryland	7
Oregon	34
Jaundice:	
Maryland	1
Oregon	1
Lead poisoning:	
Illinois	5
Michigan	5
Ohio	11
Mumps:	
Georgia	218
Idaho	3
Illinois	664
Iowa	1,381
Maryland	143
Michigan	1,393
New Jersey	928
New Mexico	144
Ohio	2,031
Oregon	704
Rhode Island	76
South Carolina	363
South Dakota	354
Texas	494
West Virginia	121
Ophthalmia neonatorum:	
Illinois	12
Maryland	1
Minnesota	1
New Jersey	2
Ohio	72
South Carolina	10
South Dakota	1
Paratyphoid fever:	
Georgia	1
Maryland	1
New Jersey	1
South Carolina	1
Texas	2
Puerperal septicemia:	
Illinois	9
New Mexico	5
Ohio	4
Oregon	1
Rabies in animals:	
Illinois	60
Maryland	4
New Jersey	10
New Mexico	1
Oregon	3
South Carolina	46
Rabies in man:	
Illinois	2
Michigan	2
Rocky Mountain spotted fever:	
Idaho	4
Oregon	8
Scabies:	
Oregon	22
Septic sore throat:	
Georgia	16
Illinois	8
Iowa	1
Maryland	25
Michigan	29

April 1935—Continued

Disease and State	Cases
Septic sore throat—Con.	
New Mexico	9
Ohio	308
Oregon	10
Rhode Island	3
South Dakota	2
West Virginia	13
Tetanus:	
Illinois	4
Maryland	2
Michigan	1
New Jersey	2
Ohio	2
Trachoma:	
Illinois	61
Minnesota	2
New Jersey	3
Ohio	4
Oregon	2
South Dakota	2
Trichinosis:	
Illinois	3
Michigan	1
Minnesota	2
New Jersey	2
Ohio	1
Tularaemia:	
Georgia	6
Illinois	1
Ohio	3
Typhus fever:	
Georgia	13
Texas	15
Undulant fever:	
Georgia	7
Illinois	7
Iowa	6
Maryland	7
Michigan	7
Minnesota	10
New Jersey	2
Ohio	7
Oregon	2
Rhode Island	2
South Carolina	3
Texas	4
Vincent's infection:	
Illinois	13
Iowa	2
Maryland	6
Michigan	22
Oregon	8
Whooping cough:	
Georgia	169
Idaho	10
Illinois	1,034
Iowa	78
Maryland	153
Michigan	1,337
Minnesota	242
New Jersey	1,515
New Mexico	134
Ohio	690
Oregon	71
Rhode Island	41
South Carolina	258
South Dakota	32
Texas	424
West Virginia	165

CASES OF VENEREAL DISEASES REPORTED FOR MARCH 1935

This statement is published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State health officers. They are preliminary and are, therefore, subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama	362	1.31	49	0.18
Arizona	44	.97	129	2.85
Arkansas	313	1.83	152	.81
California	1,572	2.59	1,415	2.33
Colorado [1]				
Connecticut	179	1.09	118	.72
Delaware	149	6.18	30	1.24
District of Columbia	114	2.91	148	2.90
Florida	617	3.97	193	1.24
Georgia	1,213	4.17	855	2.94
Idaho	0		0	
Illinois	1,320	1.69	1,072	1.37
Indiana	245	.74	242	.74
Iowa [2]	121	.49	140	.56
Kansas	104	.55	65	.34
Kentucky	207	.78	273	1.03
Louisiana	166	.77	106	.49
Maine	40	.50	37	.46
Maryland	748	4.50	194	1.17
Massachusetts	556	1.29	513	1.19
Michigan	537	1.06	467	.93
Minnesota	311	1.20	289	1.11
Mississippi	1,085	5.20	1,775	8.67
Missouri	910	2.48	208	.81
Montana [2]	36	.67	39	.72
Nebraska	39	.28	52	.37
Nevada [1]				
New Hampshire	14	.30	11	.23
New Jersey	773	1.84	267	.64
New Mexico [2]	43	.99	23	.53
New York	5,992	4.62	1,500	1.16
North Carolina	1,344	4.10	433	1.32
North Dakota [3]				
Ohio	865	1.27	327	.48
Oklahoma [2]	177	.85	182	.87
Oregon	75	.76	65	.66
Pennsylvania	310	.32	217	.22
Rhode Island	95	1.35	57	.81
South Carolina [2]	318	1.82	431	2.47
South Dakota	4	.06	16	.23
Tennessee [2]	682	2.56	310	1.28
Texas	561	.93	152	.25
Utah [1]				
Vermont	10	.53	23	.04
Virginia [2]	393	1.61	261	1.08
Washington	181	1.13	207	1.29
West Virginia [3]				
Wisconsin [4]	11	.04	137	.46
Wyoming [1]				
Total	22,885	1.89	13,303	1.09

[1] Not reporting.
[2] Incomplete.
[3] Has been reporting regularly but no report received for current month.
[4] Only cases of syphilis in the infectious stage are reported.

NOTE.—Surveys in which all medical sources have been contacted in representative communities throughout the United States have revealed that the monthly rate per 10,000 population is 6.6 for syphilis and 10.2 for gonorrhea.

PLAGUE-INFECTED GROUND SQUIRRELS IN MODOC COUNTY, CALIF.

The director of public health of California has reported 7 plague-infected ground squirrels received at the laboratory May 9 and 16, 1935, from ranches in Modoc County, Calif., 4 miles south and 12 to 16 miles west of Alturas.

WEEKLY REPORTS FROM CITIES

City reports for week ended May 11, 1935

This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference

State and city	Diphtheria, cases	Influenza		Measles, cases	Pneumonia, deaths	Scarlet fever, cases	Smallpox, cases	Tuberculosis, deaths	Typhoid fever, cases	Whooping cough, cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0		0	2	6	0	0	0	0	3	31
New Hampshire:											
Concord	1		0	0	3	1	0	0	0	0	15
Manchester	0		0	0	3	0	0	0	0	0	18
Nashua	0			0		1	0		0	0	
Vermont:											
Barre	0		0	4	0	0	0	0	0	0	1
Burlington	0		0	30	0	0	0	0	0	0	12
Massachusetts:											
Boston	1		1	57	7	44	0	11	1	14	212
Fall River	2		0	3	2	4	0	0	0	1	31
Springfield	0		0	122	2	13	0	1	0	6	33
Worcester	0		0	6	11	19	0	4	3	5	53
Rhode Island:											
Pawtucket											
Providence	0		0	265	1	6	0	2	0	16	56
Connecticut:											
Bridgeport	0		0	3	3	9	0	2	0	0	35
Hartford	1		0	28	5	13	0	1	0	0	56
New Haven	0		0	376	2	1	0	0	0	0	40
New York:											
Buffalo	0		0	0	10	55	0	8	0	0	131
New York	20	10	5	1,595	184	655	0	114	3	238	1,607
Rochester	0		0	97	5	33	0	0	0	13	82
Syracuse	0		0	522	6	23	0	2	0	8	51
New Jersey:											
Camden	1		0	2	5	1	0	1	0	0	38
Newark	0	2	0	507	9	20	0	3	0	51	105
Trenton	0		0	1	2	9	0	1	0	1	30
Pennsylvania:											
Philadelphia	4	4	1	93	35	126	0	32	3	65	527
Pittsburgh	4	3	5	405	23	43	0	7	0	17	152
Reading	0		0	118	1	10	0	0	0	3	20
Scranton	0			10		3	0		0	2	
Ohio:											
Cincinnati	4		2	11	10	23	0	7	0	4	152
Cleveland	4	27	1	408	30	61	0	17	0	39	214
Columbus	0	3	3	75	1	30	0	4	0	0	91
Toledo	2	2	2	172	9	16	0	4	0	9	67
Indiana:											
Fort Wayne	2		0	4	1	0	0	0	0	1	23
Indianapolis	4		0	105	20	15	0	0	0	24	104
South Bend	0		0	0	1	4	0	1	0	1	18
Terre Haute	0		0	0	0	0	0	1	0	0	18
Illinois:											
Chicago	31	3	1	1,262	62	655	0	49	0	61	705
Springfield	0		0	17	5	8	0	1	0	2	25
Michigan:											
Detroit	5	1	3	1,766	40	129	0	19	0	105	287
Flint	0		0	8	2	32	0	3	0	0	23
Grand Rapids	0		0	156	1	15	0	0	1	41	28
Wisconsin:											
Kenosha	0		0	15	0	15	1	0	0	2	5
Milwaukee	0		0	309	6	113	0	6	0	15	101
Racine	0		0	141	0	30	0	1	0	17	14
Superior	0		0	21	0	1	0	0	0	3	10

City reports for week ended May 11, 1935—Continued

State and city	Diphtheria, cases	Influenza: Cases	Influenza: Deaths	Measles, cases	Pneumonia, deaths	Scarlet fever, cases	Smallpox, cases	Tuberculosis, deaths	Typhoid fever, cases	Whooping cough, cases	Deaths, all causes
Minnesota:											
Duluth	0	-----	0	115	1	3	0	0	0	1	19
Minneapolis	10	-----	0	101	9	141	0	0	0	31	121
St. Paul	0	-----	0	15	5	61	0	0	1	7	66
Iowa:											
Davenport	0	-----	-----	1	-----	4	0	-----	0	0	-----
Des Moines	0	-----	-----	208	-----	2	0	-----	0	2	40
Sioux City	1	-----	0	0	0	1	0	0	0	5	2
Waterloo	3	-----	0	1	0	11	0	0	0	0	-----
Missouri:											
Kansas City	3	-----	0	69	9	15	1	8	0	0	98
St. Joseph	0	-----	1	5	4	1	0	0	0	1	19
St. Louis	6	-----	1	15	10	20	0	10	0	6	201
North Dakota:											
Fargo	0	-----	0	2	2	11	0	0	0	1	8
Grand Forks	0	-----	-----	0	-----	0	0	-----	0	0	-----
South Dakota:											
Aberdeen	0	-----	-----	8	-----	0	0	-----	0	1	-----
Nebraska:											
Omaha	2	-----	0	66	10	11	0	4	0	0	66
Kansas:											
Topeka	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Wichita	0	-----	0	43	3	2	0	1	0	2	32
Delaware:											
Wilmington	0	-----	0	9	3	3	0	0	0	0	25
Maryland:											
Baltimore	1	3	0	36	18	55	0	10	0	11	204
Cumberland	0	1	1	3	0	2	0	0	0	0	13
Frederick	0	-----	0	0	1	0	0	0	0	0	2
District of Columbia:											
Washington	8	1	1	73	11	64	0	18	0	1	162
Virginia:											
Lynchburg	1	-----	0	6	2	1	0	2	0	24	17
Richmond	0	-----	2	40	5	4	0	3	1	0	55
Roanoke	1	-----	0	26	2	0	0	0	0	7	11
West Virginia:											
Charleston	1	-----	0	9	1	0	0	1	0	0	14
Huntington	1	-----	-----	13	-----	4	0	-----	0	0	-----
Wheeling	0	-----	0	44	3	3	0	0	0	1	21
North Carolina:											
Raleigh	0	-----	0	5	3	0	0	2	0	3	16
Wilmington	0	-----	0	0	0	0	0	1	0	1	13
Winston-Salem	0	-----	0	2	0	0	0	1	0	9	18
South Carolina:											
Charleston	0	5	0	0	0	0	0	5	0	3	22
Columbia	0	-----	0	0	1	0	0	0	0	0	12
Greenville	0	-----	0	2	2	0	0	0	0	0	15
Georgia:											
Atlanta	8	6	3	1	7	4	0	3	0	2	99
Brunswick	0	-----	0	0	0	0	0	0	0	6	7
Savannah	0	-----	0	1	2	0	0	1	2	0	27
Florida:											
Miami	2	-----	0	1	2	2	0	2	0	4	23
Tampa	2	-----	0	29	2	0	0	1	0	0	20
Kentucky:											
Ashland	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Lexington	0	-----	-----	15	-----	0	0	-----	0	0	19
Louisville	7	6	0	326	12	29	0	3	0	10	70
Tennessee:											
Memphis	2	-----	2	0	4	2	0	4	0	12	84
Nashville	0	-----	0	0	4	4	0	3	0	7	40
Alabama:											
Birmingham	0	4	0	61	6	1	0	5	1	5	59
Mobile	2	-----	0	3	1	0	0	2	1	0	16
Montgomery	2	-----	0	1	0	0	0	0	0	1	-----
Arkansas:											
Fort Smith	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Little Rock	0	-----	1	7	2	3	0	0	0	20	6
Louisiana:											
New Orleans	13	1	1	36	8	5	0	10	1	1	126
Shreveport	0	-----	0	13	5	0	0	4	1	0	35

City reports for week ended May 11, 1935—Continued

State and city	Diphtheria, cases	Influenza		Measles, cases	Pneumonia, deaths	Scarlet fever, cases	Smallpox, cases	Tuberculosis, deaths	Typhoid fever, cases	Whooping cough, cases	Deaths, all causes
		Cases	Deaths								
Texas:											
Dallas	1		0	0	4	3	0	5	0	0	60
Fort Worth	1		0		3	1	0	4	0	2	42
Galveston	0		0	0	1	0	0	0	0	0	18
Houston	11		0	2	6	0	1	2	1	0	62
San Antonio	4		2	0	4	0	0	7	0	0	62
Montana:											
Billings											
Great Falls	0		0	9	5	2	0	0	0	15	15
Helena	0		0	1	0	0	0	0	0	21	6
Missoula	0		0	17	0	0	0	0	0	0	6
Idaho:											
Boise	1		0	6	2	0	0	0	0	0	7
Colorado:											
Denver	6	31	0	207	4	97	1	5	1	3	89
Pueblo	0		0	66	3	3	0	1	0	1	15
New Mexico:											
Albuquerque	0		0	7	2	1	0	5	0	0	14
Utah:											
Salt Lake City	2		1	9	2	90	0	0	0	89	43
Nevada:											
Reno	0		0	2	0	0	0	0	0	0	3
Washington:											
Seattle	0		0	183	4	19	1	5	0	6	97
Spokane	0		0	72	5	4	0	1	0	2	31
Tacoma	0		0	7	2	7	8	0	1	1	26
Oregon:											
Portland	0		0	103	8	16	0	2	0	1	89
Salem	0	4		3		2	1		0	0	
California:											
Los Angeles	10	17	6	88	12	49	7	14	0	16	334
Sacramento	0		0	275	2	11	4	1	0	0	27
San Francisco	0		0	49	8	21	0	6	2	28	163

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Rhode Island:				Missouri:			
Providence	1	1	0	St. Joseph	1	0	0
New York:				St. Louis	3	0	0
New York	18	9	4	Nebraska:			
Pennsylvania:				Omaha	1	0	0
Philadelphia	2	1	0	Maryland:			
Ohio:				Baltimore	9	3	0
Cincinnati	12	6	0	District of Columbia:			
Cleveland	1	1	0	Washington	11	5	0
Columbus	1	0	0	Virginia:			
Toledo	1	0	0	Lynchburg	0	1	0
Indiana:				Georgia:			
Indianapolis	3	0	0	Atlanta	2	0	0
Terre Haute	0	1	0	Kentucky:			
Illinois:				Louisville	2	0	0
Chicago	10	2	0	Tennessee:			
Michigan:				Memphis	2	0	0
Detroit	0	1	0	Arkansas:			
Wisconsin:				Little Rock	0	1	1
Milwaukee	0	0	1	Louisiana:			
Minnesota:				New Orleans	0	0	1
Minneapolis	0	1	0	California:			
Iowa:				Los Angeles	3	0	4
Sioux City	2	2	0	San Francisco	1	1	0

Epidemic encephalitis.—Cases: New York, 1; Columbus, 1; St. Louis, 2.
Pellagra.—Cases: Washington, 1; Charleston, S. C., 5; Atlanta, 1; New Orleans, 4; Los Angeles, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended April 20, 1935.—During the 2 weeks ended April 20, 1935, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis			2	1	3	1				7
Chicken pox		2	4	265	407	56	40	28	145	956
Diphtheria		8	1	22	7	11	5	2	3	59
Dysentery				8						8
Erysipelas				7	3	2	2	4	1	19
Influenza		75		23	34	5	7		298	442
Lethargic encephalitis		1						1		2
Measles		117	109	1,419	5,426	191	136	10	121	7,532
Mumps		38	1		400	99	3	35	47	683
Paratyphoid fever					1					1
Pneumonia		3			42		6		21	72
Poliomyelitis					1					1
Scarlet fever		39	9	200	290	15	17	26	37	633
Tuberculosis	2	5	28	112	78	32	3	7	20	287
Typhoid fever			1	24	3	1				29
Undulant fever				1	6	1	1			9
Whooping cough			16	89	304	93	95	26	81	704

CEYLON[1]

Malaria.[2]—The malaria epidemic in Ceylon, which began in October 1934, reached its peak in the third week of December; and it is estimated that, by the second week of the latter month, 500,000 persons had been attacked. The area affected was within the southwest quadrant (wet zone) of the island, the most densely populated part, comprising one-fifth the area but with 3,500,000 people out of a total population of 5,500,000. During 1934 a prolonged drought prevailed over a large part of this area. The drying up of the streams provided ideal conditions for the breeding of *Anopheles culicifacies*, which transmitted the infection; 21 percent of this species collected from the houses of one area were found to harbor oocysts or sporozoites. *Plasmodium vivax* was the predominating parasite.

[1] For earlier reports on the malaria outbreak in Ceylon see pp. 34, 113, 356, 499, and 631 of prior issues of the PUBLIC HEALTH REPORTS.

[2] From extracts of a report of the director of medical and sanitary services, Ceylon, published in the annual report (1934) of the director of the eastern bureau of the health organization of the League of Nations, Singapore.

The case fatality rate generally was not high, considering the intensity of the epidemic. Among 2,223 hospitalized patients in the Kegalla district the rate was 2.87 percent; but in a hospital in Colombo, with a preponderance of subtertian malaria, the rate among 1,200 admissions was 6.75 percent. No infections were recorded at altitudes above 2,400 feet.

The common complications were (1) a dysenteric form of diarrhea, which yielded to quinine therapy; (2) convulsions in children; and (3) edema of the face and feet, during convalescence, especially in ill-nourished children. This latter condition was very prevalent and is under investigation.

The measures adopted were (1) mass treatment by quinine and (2) the supplying of food where destitution and malaria coexisted. The standard treatment for adults was 7½ grains of quinine sulphate or bisulphate in solution 3 times a day. Plasmochin and atabrine were used extensively in hospitals, but not in dispensaries or for mass treatment. Drug prophylaxis was not attempted on a large scale. Antilarval measures were intensified in Colombo and other towns but could not be applied in the rural areas.

CUBA

Habana—Communicable diseases—4 weeks ended May 11, 1935.—During the 4 weeks ended May 11, 1935, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	1		Tuberculosis	43	10
Malaria	[1] 14		Typhoid fever	[1] 6	3
Poliomyelitis	[1] 2				

[1] Includes imported cases.

Provinces—Notifiable diseases—4 weeks ended May 4, 1935.—During the 4 weeks ended May 4, 1935, cases of notifiable diseases were reported in the Provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer				3		1	4
Chicken pox		1		2			3
Diphtheria	1		1	6			8
Hookworm disease				4			4
Leprosy				6			6
Malaria	133	1	35	191	35	219	614
Measles	21	15	4	18	2	4	64
Poliomyelitis			1	4			5
Scarlet fever			1	1			2
Tuberculosis	4	10	23	43	18	26	124
Typhoid fever		11	7	22	24	19	83

ITALY

Communicable diseases—4 weeks ended March 31, 1935.—During the 4 weeks ended March 31, 1935, cases of certain communicable diseases were reported in Italy, as follows:

Disease	Mar. 4-10		Mar. 11-17		Mar. 18-24		Mar. 25-31	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	5	5	5	5	4	4	8	6
Cerebrospinal meningitis	19	15	20	17	28	22	15	13
Chicken pox	312	119	449	123	379	114	436	136
Diphtheria and croup	400	280	547	260	550	289	563	287
Dysentery	1	1	3	3	4	4	3	3
Lethargic encephalitis	3	3	6	6	3	3	2	2
Measles	2,782	337	3,709	325	3,149	372	3,427	357
Poliomyelitis	4	4	7	7	4	4	3	3
Scarlet fever	229	108	230	88	282	118	330	110
Typhoid fever	166	98	160	109	169	106	166	115

PERU

Callao—Plague.—A report dated May 3, 1935, states that according to the Director General of Public Health, Ministry of Public Works, in Lima, Peru, the last case of human plague in the port of Callao occurred during the latter part of March 1935.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following table must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Dec. 30, 1934–Jan. 26, 1935	Week ended— February 1935: 2	9	16	23	March 1935: 2	9	16	23	30	April 1935: 6	13	20	27
Ceylon:																		
Colombo	C							16	6	4	1							
	D							12	5	3								
Peliyagoda	C							10	12									
	D							6	11									
India	C	19,1[illegible]0	18,176	17,836	16,371	3,643	3,425	3,721	3,821	3,370	3,563	3,358	4,[illegible]57					
	D	9,524	8,759	8,432	6,582	1,949	1,823	1,957	1,932	1,719	1,913	1,741	2,[illegible]38					
Assam	C	43	227	645	874	37	20	45	25	47	40	51	87	105	354	437	633	616
	D		133	274	419	37	9	24	12	22	21	25	42	59	157	270	361	416
Bassein	C			15	8	1	1	2	2	3				1	1	3	2	15
	D			9	9		1	2	1	1	1				1	3	1	9
Bombay Presidency	C	1,973	872	592	90	19	18	25	88	74	32	33	48	48		13	51	
	D	925	583	256	45	8	7	12	32	37	12	17	16	14		8	29	
Bombay	C										6							1
Calcutta	C	110	78	166	174	96	151		197	154	156	154	157	157	151	163	205	262
Chittagong	C	1	1	12				2	2	3	3			9	7		9	3
Madras Presidency	C	1,098	1,501	5,157	7,693	2,142	1,696	1,380	1,255	875	843	696	631	633				
	D	528	895	2,469	4,115	1,116	866	728	630	473	413	360	363	318				
Madras	C	7	59	28	25	3	2	1		1		1	1			1		1
	D	5	32	12	17	1	1	1					1					
Porto Novo	C			P														
Mergui	C						2											
Moulmein	C				1	7		11	8	4	2		[1] 2			4	[1] 2	
Negapatam	C		1		12		1		1	1	2		9	2	3	5		2
Rangoon	C			1	21	10	7	10	7		2	3	3	[1] 1	7	3	3	3
Tuticorin	C				1									[1] 1	18		14	5
India (French):																		
Chandernagor	C	1								1				16	14			
Karikal	C	5	2	11	55	15	2	9	2	5	8	2	2					
Pondichery	C		10	29	50	4	4	13	6	2		1	4	2	2			
India (Portuguese)	C			10														

[1] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Dec. 30, 1934–Jan. 26, 1935	Week ended— February 1935				March 1935					April 1935			
						2	9	16	23	2	9	16	23	30	6	13	20	27
Indo-China (see also table below):																		
Kandal	C				2													
Pnom-Penh	C			2			1							1				
Siam:																		
Bangkok	C										1							
Nagara Rajsima—Roy Ech	C									13								
	D									2								
On vessels:																		
S. S. *Ellenga* at Rangoon from Calcutta	C				1													
S. S. *Tilawa* at Cocanada	C						[2] 1											
S. S. *Egra* at Rangoon	C				[2] 1													
S. S. *Santhia* at Rangoon from Calcutta	C								1									
S. S. *Incomati* at Colombo	C											1						
	D											1						
S. S. *Pasha* at Rangoon from Moulmein	C										1							
S. S. *Khandalla* at Rangoon	C											1						
S. S. *Juna* at Moulmein from Mergui	C											1						
S. S. *Karoa* at Rangoon	C											1						

Place		November 1934			December 1934			January 1935			February 1935			March 1935		
		1–10	11–20	21–30	1–10	11–20	21–31	1–10	11–20	21–31	1–10	11–20	21–28	1–10	11–20	21–31
Indo-China (French) (see also table above):																
Cambodia [3]	C	3								2	1	3		3		1
	D	3								2	1	3		3		1
Cochin-China [3]	C	1	2						1			2		2	1	1
	D	1	2						1			1		2	1	1

[1] Imported. [2] Suspected. [3] Reports incomplete.

PLAGUE[1]—Continued

[C indicates cases; D, deaths, P, present]

Place		Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Dec. 30, 1934–Jan. 26, 1935	Week ended— February 1935: 2	9	16	23	March 1935: 2	9	16	23	30	April 1935: 6	13	20	27
Argentina (see also table below): Santiago de Estero Province—Frias	C			1														
Azores. (See table below.)																		
Belgian Congo	C		14		4								P					
Bolivia: Tomina Province. (See table below.)																		
Brazil:																		
Alagoas State	C			5														
	D			2														
Ceara State	C			2														
British East Africa (see also table below):																		
Kenya	C	1	5	4								1		1				
Tanganyika	C													1				
Uganda	C	89	79	122	79	9	16	10	15	4	11	2	10		20	15	25	
	D	85	75	114	76	9	16	10	14	4	11	2	10		19	14	23	
Canary Islands: Las Palmas	C				1													
Ceylon: Colombo	C		2	1		1	1			2	2	1					1	
	D		2	1			2			2	2						1	
Plague-infected rats			3									4			5	8	1	1
China (see also table below):																		
Amoy	C									[2] 1								
Kangping.[3]																		
Manchuria.[4]																		
Mansantun[5]	D			4														

[1] Including plague in the United States and its possessions.

[2] Imported

[3] A report dated Jan. 29, 1935, states that up to Jan. 23, 79 cases of plague with 78 deaths were reported near Kangping, China, the report also states that up to Jan. 21, 50 deaths from plague were reported in 6 villages of the Pe Wang Fu District, northwest of Kangping.

[4] A report dated Oct. 30, 1934, states that from June to Oct. 25, 1934, deaths from plague had been reported in Manchuria, China, as follows Fengtien Province—Liaoyuan 30, Shuangshan 21, Tungliao 41, Kirin Province—Changling 12, Chienan 26, Fuyu 32, Hsinking City 1, Nungan 168.

[5] Up to Jan. 5, 1935, 44 cases of plague with 35 deaths were reported at Mansantun, Manchuria, China.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Dec. 30, 1934–Jan. 26, 1935	Week ended— February 1935 2	9	16	23	March 1935 2	9	16	23	30	April 1935 6	13	20	27
Dutch East Indies:																		
Cheribon	C								[3] 1									
Java—Batavia	C	5																
	D	5																
West Java	C	1,684	1,658	2,905	2,425	515	508	422	350	340								
	D	1,684	1,658	2,900	2,425	514	508	422	350	340								
Ecuador (see also table below):																		
Celica	C							[6] 16										
Pungala and Tixan (near)	C							[6] 14										
Egypt:																		
Alexandria [7]—Plague-infected rats		P	P	P	P	P		P		P		P		P		P		
Asyut	C		2							1				2		1		3
Beni-Suef	C		1															
Girga	C				1	1								1				
Hawaii Territory:																		
Hawaii Island—Hamakua district[8]—																		
Kalopa—Plague-infected rats		1	3															
Paauhau	C		1										1					
	D		1											1				
Plague-infected rats		1												2				
Pohakea—Plague-infected rats		1																1
Maui Island—Makawao district—																		
Kahului (9–10 miles from)—Plague-infected rats		2									1	1						1
Paia—Plague-infected rats		1																
India	C	5,642	4,167	4,549	5,852	1,279	1,545	1,628	2,411	1,713	1,915	1,525	1,956					
	D	3,114	2,424	2,875	3,503	706	945	851	1,350	990	1,031	955	1,094					
Bassein	C	2	3	1			1					2	2	2	5	1	2	
Plague-infected rats		1										1						
Bombay Presidency	C	2,759	2,093	1,331	1,074	360	262	266	345	209	268	192	142	163		96	64	
	D	1,626	1,109	823	603	179	129	167	211	114	144	122	72	95		52	25	
Bombay	C				1													
Plague-infected rats		1																
Madras Presidency	C	309	230	258	237	65	38	39	19	25	36	23	12	16				
	D	153	92	127	119	35	16	30	15	10	19	14	6	5				
Mandalay	C					2												

Moulmein	C										[2]1					1	1	
	D										[6]1							
Northwest Frontier Province	C											15						
	D											7						
Punjab	C	29	53	59	32	14	15	55	20	74	37	51	62	119	[illegible]	55	138	155
	D	17	35	45	19	9	16	25	17	39	18	53	27	73	18	42	63	109
Rangoon	C				1		[2]1					1					1	
Plague-infected rats				1								1						
Indo-China (see also table below):																		
Bentre	C									1								
Haiphong	C																	
Kandal	C				1													1
Pnom-Penh	C	2	1	2														
Saigon and Cholon	C		2															
Tanghai Island	C																	
Madagascar. (See table below.)																12		
Morocco:																		
Saffi Region	C													9		7	4	3
	D													5	2	5	2	2
Tangier	C																	
Peru. (See table below.)																		
Senegal. (See table below.)																		
Siam:																		
Prachin—Nagara Nayok	C			4														
Nagara Rajsima	C							1										
Rajburi	C				1					1								
South-West Africa. [9]																		
Tunisia: Tunis—Plague-infected rats									1									
Union of South Africa:																		
Cape Province	C				3	3												
Orange Free State	C	3	3	3		[10]39												
United States: California—Plague-infected ground squirrels—																		
Modoc County [11]																		3
San Luis Obispo County																		1

[2] Imported.
[6] For 2 weeks.
[7] During the week ended May 11, 1935, 1 case of bubonic plague was reported at Alexandria, Egypt.
[8] On May 8, 1935, 1 plague-infected rat was found at Hamakua District, Hawaii Island, Hawaii Territory.
[9] During the months of January and February 1935, 68 cases of plague with 16 deaths were reported in Ovamboland, South-West Africa.
[10] For 4 weeks.
[11] For the period Apr. 26 to May 16, 1935, 16 plague-infected ground squirrels were reported in Modoc County, Calif.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		October 1934	November 1934	December 1934	January 1935	February 1935	March 1935
Argentina (see also table above): Santa Fe	C					1	1
Azores	C		1	1	2	3	
Bolivia: Tomina Province	C				4	4	4
British East Africa (see also table above): Kenya	C	1	6				
China: Kwangchowan	C		3				
	D		3				
Ecuador:							
Chimborazo Province	C					4	
Loja Province	C					18	17
Indo-China (see also table above):							
Cambodia	D	4	4	2	1		
Cochin-China	C		2				1
Naotchao Island	C						20
Madagascar (central region)	C	444	431	381	510	491	211
	D	422	410	364	502	472	203
Peru	C		2	5	5	15	14
Lima department	C	3	1	1	1	6	5
Senegal.							
Dakar [13]	C	13	4	2	2	1	2
	D	11	3	2	2	1	2
Rufisque [12]	C	8	4		1		
Theis [13]	C	6					
Tivaouane [13]	C	21	3	1			

[13] Reports incomplete.

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Dec. 30, 1934–Jan. 26, 1935	Week ended— February 1935 2	9	16	23	March 1935 2	9	16	23	30	April 1935 6	13	20	27
Algeria:																		
Algiers Department	C	1					1						2					
Constantine Department	C	1																
Belgian Congo (see also table below)	C		102		5													
Bolivia. (See table below.)																		
Brazil:																		
Porto Alegre (alastrim)	C	1																
Recife	C			1														
Sergipe State	C		P															
British East Africa:																		
Kenya	C	21	17	13														
Tanganyika	C	16	14	63	2			3				15		11	3			
British Somaliland	C	7	5		8	11		10	8	2	2	8	7	7	5	9		
British South Africa:																		
Northern Rhodesia	C							25				27						
Southern Rhodesia	C	2		1														
Canada:																		
Alberta	C		2	1														
Manitoba	C	[1] 1																
Ontario	C						[1] 1		[1] 1						2			
Saskatchewan	C	2	1												[1] 1			
Canary Islands: Santa Cruz de Tenerife	C			3														
Ceylon:																		
Colombo	C	3	11	12	15	1												
Galle	C											13	1					
Welitara	C									11	15	22	2					
China:																		
Amoy	C		1		1						1		5	1	2			
Canton	C		3	9	7	3	1	2		2	1	4	3	2		1		
Dairen	C			2	4		1			2			2					
Foochow	C	P	P	P	P		P		P		P		P		P		P	
Hankow	C	1	1	16	19	10	2	1	2	2	2	8	1	1	3	1		
Hong Kong	C		2	2	8	1	5	2	1	6	3	2	1	2	1	2	3	6
Macao	D		3	43	47	12	12	20	9	7	8	5	1	2	1	1		
Nanking	C			1	1	1					1	2	2					

[1] For 2 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Dec. 30, 1934–Jan. 26, 1935	Week ended— February 1935 2	9	16	23	March 1935 2	9	16	23	30	April 1935 6	13	20	27
China—Continued.																		
Shanghai	C	2	1	8		2	1		1	1			1	3	1		1	1
Swatow	C							1					1	1				
Tientsin	C	2	3	7	6	3		6	2	2	4	2	1		5			
Tsingtao	C	1	3	2	11		6	11		3	7	1	5		4			
Chosen. (See table below.)																		
Colombia	C				11	20	1		2		5		2	1	12	4		
Dahomey. (See table below.)																		
Dutch East Indies: Balei	C				4													
Egypt:																		
Dakahliya	C					56	18	13		1			2	1		2	15	
Gharbiya	C									3								
Sharkiya	C	74																
Suez	C									[1] 1								
Provinces	C	46	3	2	4				3	6		6	9					
Formosa	C				P													
France. (See table below.)																		
French Somaliland	C				11	6	6	2	2	2	6	5		1	1			
Great Britain:																		
England and Wales	C	1	1															
London	C	1																
London and Great Towns	C	1																
Greece: Salonika	C	3			1			1	1	1	1	1	1	1	1			
Guatemala. (See table below.)																		
Honduras: Tela	C			7	2		[1] 5		[1] 3								6	
India	C	4,421	7,163	17,092	23,522	7,336	8,195	7,358	8,614	5,104	8,745	9,173	9,246					
	D	846	1,431	4,189	5,444	1,577	1,761	1,604	1,734	1,648	1,756	1,891	1,753					
Assam	C				27	3	5		19	9	12	6	3	17	13	4	4	11
Bassein	C				1													
	D				2													
Bombay Presidency	C	628	1,245	2,834	4,816	1,879	1,979	2,050	1,870	2,222	2,123	2,456	2,053	2,534		[illegible]	2,531	
	D	132	204	578	1,019	387	361	348	349	412	427	436	386	530		[illegible]	455	
Bombay	C	8	5	18	87	56	46	75	58	59	81	91	91	119	[illegible]	111	119	116
	D	5	4	11	41	35	22	25	32	28	44	60	57	73	61	65	59	72

Calcutta	C	3	4	51	79	20	42	35	73	58	92	74	56	149	125	52	104	152
	D		1	32	52	16	25	17	45	34	47	47	33	80	120	43	69	104
Chittagong	C							[1] 1		[2] 2								
Cochin	C				2	4			2			3	1	1	2			
Karachi	C			7	11	4	8	9	11	8	16	6	11	2	12	10	10	11
Madras Presidency	C	[illegible]	[illegible]	2,727	5,324	1,289	1,415	1,641	1,634	1,246	1,196	1,149	1,254	1,215				
	D	414	443	468	851	233	241	195	166	150	187	205	216	156				
Madras	C	27	5	19	36	14	11	16	7	8	17	10	7	16	12	13	5	9
Moulmein	C							[1] 1					1	1				
Negapatam	C	5	3	24	33	10	14	8	11	12	21	8	3	11	8	10	2	3
Punjab	C	[illegible]	[illegible]	275	279	52	41	64	37	25	55	63	19	28	[illegible]	31	31	41
Rangoon	C	[illegible]	3	3	24	5	34	27	5	45	78	24	41	33	35	17	25	20
Tuticorin	C			3	4									1		25		
Vizagapatam	C		16	28	92	23	38	13	45	30	21	21	36	20	42	27	18	32
India (French):																		
Chandernagor	C					1				2				4	24			
Karikal	C	1	1	13	14		3		5	4	1		5	4	7			
Mahe	D		7															
Pondichery	C	[illegible]	24	182	91	25	24	17	12	17	13	23	32	25	15			
	D	51	47	63	70	20	24	16	12	16	13	20	26	[illegible]	15			
Indo-China (see also table below):																		
Haiphong	C				1						1	2				1	2	1
Pnom-Penh	C										3	1	1	3				
Saigon and Cholon	C																	2
Tourane	C	4	5	5	2		1	1	3		4	2						
Iran	C	7	4	1	4	3		1	3			1						
Teheran	C		2	2														
	D	1	1															
Iraq	C	5	1	33	34	2			5		3	1	2		1	6		
Arbil	C	2		3	1	2	2									2		
Baghdad	C	1																
Basra	C			6												1	1	
Mosul liwa	C				9					6		1	2			1		
Japan (see also table below)	C		1	141														
Kobe	C						1											
Nagasaki	C							1		3								
Taiwan	D			2														
Lithuania. (See table below.)																		
Mexico:																		
Allende [3]																		
Chihuahua	C		2	17	7		1	5	2	3			15		[1] 1			[4] 10
Mazatlan	C													1				1
Mexico, D. F.	C	6		7	37	24	31	26	17									
Monterrey	C									1								2
San Luis Potosi	D			1														1
Vera Cruz	C												[2] 1					

[1] For 2 weeks.
[2] Imported.
[3] A report dated Dec. 28, 1934, states that about 48 cases of smallpox with 5 or 6 deaths had been reported at Allende, Mexico.
[4] For 3 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Dec. 30, 1934–Jan. 26, 1935	Week ended— February 1935 2	9	16	23	March 1935 2	9	16	23	30	April 1935 6	13	20	27
Morocco. (See table below.)																		
Mozambique. (See table below.)																		
Nigeria	C	129	115	328	78	56	171	78	67	34	50							
Lagos	C							1										
Nyasaland. (See table below.)																		
Palestine	C			1	2		4						2					
Peru. (See table below.)																		
Poland	C	1	1											1				
Portugal (see also table below):																		
Lisbon	C	2	2	1						3		1	1		1	1		
Oporto	C		1	1														
Portuguese East Africa. (See table below.)																		
Salvador	C	13	10	28	68													
Siam	C	4	13	20	24		1		1									
Bangkok	C				[2] 1		1											
Sierra Leone	C	[1] 14	[1] 60	172	111	[1] 133		[1] 162		[1] 95		[1] 19		[1] 9		[1] 19		
Spain	C	12	105	78	16		3	8	4	13		4	9	8	6	3		
Straits Settlements: Singapore	C	2																
Sudan (Anglo-Egyptian)	C	1		12	13	5	2	1	1			4	1	3	12	1	5	
Syria:																		
Damascus	C		33	49	6	2												
Provinces	C	51	113	114	28	3	1				2							
Trans-Jordan	C		[2] 1															
Tunisia	C				5													
Turkey. (See table below.)																		
Union of Soviet Socialist Republics. (See table below.)																		

[1] For 2 weeks.
[2] Imported.

On vessels:

- S. S. *Rhona* at Penang from Madras — 1 case — Oct. 4, 1934
- S. S. *Erinpura* at Rangoon from Madras — 1 case — Oct. 8, 1934
- S. S. *Kwang-Si* at Jibuti — 1 case — Nov. 24, 1934
- S. S. *Varela* at Basra — 1 case — Dec. 6, 1934
- S. S. *Talma* at Hong Kong — 1 case — Jan. 19, 1935
- S. S. *Chilka* at Rangoon from Gopalpore — 1 case — Jan. 23, 1935
- S. S. *Aorangi* at Sydney from Vancouver — 1 case — Jan. 24, 1935
- S. S. *Hosang* at Singapore from Osaka — 1 case — Feb. 2, 1935
- S. S. *Rhona* at Port Swettenham from Madras — 1 case — Feb. 22, 1935
- S. S. *Mongolia* at Suez from Australia — 1 case — Feb. 24, 1935
- S. S. *Ellenga* at Rangoon — 1 case — Feb. 26, 1935
- S. S. *Suisang* at Singapore from Hong Kong — 1 case — Feb. 27, 1935
- S. S. *Empress of Britain* at Singapore from Bombay — 1 case — Mar. 3, 1935
- S. S. *Cremer* at Singapore from Amoy — 1 case — Mar. 11, 1935

On vessels—Continued.

- S. S. *Kutsang* at Hong Kong — 1 case — Mar. 14, 1935
- S. S. *Tatsuta Maru* at San Francisco — 1 case — Mar. 14, 1935
- S. S. *Tatsuta Maru* at San Francisco — 1 case — Mar. 15, 1935
- S. S. *Pendeen* at Port Said from Odessa — 1 case — Mar. 16, 1935
- S. S. *Anhui* at Singapore from Hong Kong — 2 cases — Mar. 22, 1935
- S. S. *Van Heutsz* at Singapore from Amoy — 1 case — Mar. 26, 1935
- S. S. *Mulbera* at Aden — 1 case — Mar. 25, 1935
- S. S. *Anshun* at Swatow from Hong Kong — 1 case — Mar. 28, 1935
- S. S. *Varsova* at Karachi — 1 case — Mar. 30, 1935
- S. S. *Jinkai Maru* at Singapore from Miike — 1 case — Apr. 3, 1935
- S. S. *Ipoh* at Penang from Singapore — 1 case — Apr. 12, 1935
- S. S. *Hong Peng* at Singapore from Amoy — 1 case — Apr. 17, 1935
- S. S. *Anhui* at Singapore from Hong Kong — 1 case — Apr. 18, 1935

Place		October 1934	November 1934	December 1934	January 1935	February 1935	March 1935
Belgian Congo (see also table above)	C	154	110		109	58	
Bolivia	C	72	53	35	52	42	42
Chosen	C	40	58	15	159	179	
Dahomey	C	6	1		3	4	
France	C	3	53	57	31	137	78
Guatemala	C	2	1	2		2	1
Indo-China (see also table above)	C	202	259	210	605	582	601
	D	39	22	25	67	69	53
Japan (see also table above)	C				21	8	
Lithuania	C			1			
Morocco	C		7	5			3
Mozambique	C	1	36		3		
Nyasaland	C	17	29	13		13	26
Peru	C	195		36	37	6	
Portugal (see also table above)	C	104	170	99	54	55	
	D	6	27	16	4	4	
Portuguese East Africa	C	1	36				
Turkey	C	2	2	5	5	19	
Union of Soviet Socialist Republics	C	231					

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Week ended— January 1935, 5	Jan. 12	Jan. 19	Jan. 26	February 1935, 2	Feb. 9	Feb. 16	Feb. 23	March 1935, 2	Mar. 9	Mar. 16	Mar. 23	Mar. 30	April 1935, 6	Apr. 13	Apr. 20
Algeria:																				
Algiers Department	C	4	4	2	2	1	1	1	1				5			6	1			4
Constantine Department	C	4		14	3	4	2	3	3	11	6	5	13	15	9	15	6	23	13	11
Bone	C							2												
Constantine	C	2	2	1		1				2	1	3		1	2		1	1	2	
Oran Department	C			2													11	2		
Southern Territories	C												6			2	3	2		1
Basutoland	C	46	23	3																
Belgian Congo	C	20	12	4	1	3									1					
Bolivia. (See table below.)																				
British East Africa: Uganda	C		10	1						4			1							
Bulgaria	C	7	7	13			8	2	1						1	3	3	2		
Chile	C	1,614	1,642	1,669	278															
Concepcion	C			5																
Iquique [1]	C	4																		
Santiago	C			431																
Valparaiso	C	17	53	65	4	11	6	1	5	1		1		2	1		2		2	
China:																				
Hangchow	C														1					
Hankow	C	1																		
Nanking	C														1					
Shanghai	C			4										1	2					
Tientsin	C						1	1												
Chosen. (See table below.)																				
Colombia	D						1													
Czechoslovakia. (See table below.)																				
Egypt:																				
Alexandria	C	1		1		1				1	2	2	3	1	3			5	4	4
Aswan	C		2	3										9	7	7	1		2	4
Asyut	C										1				4	6	1			
Beheira	C			17	5	14			44	23	37	58	34	34	53	[illegible]	22	57	72	63
Beni-Suef	C									3					2				1	
Cairo	C		1	1		1					3	4	2			3			4	1
Dakahliya	C		1			4		6	3	15	44	46	22	16	12	6	6	3	5	3
Damietta	D	1		1																
Faiyum	C	1																		
Gharbiya	C	1	6	6		4		29	35	41	73	84	61	40	53	[illegible]	35	26	54	38
Girga	C					1											7		1	1
Minufiya	C		15	21	1	2			4	7	9	13	7	10	16	15	36	27	35	35
Minya	C																1	1	1	1
Port Said	C		2	2					1							1	1			

Qena	C	3	1	6																
Sharkiya	C			1		1		6	4	7	12	9	7	4	9	33	5		8	10
Suez	C																1			
Provinces	C	20	24	59	9	27	39	65	87	95	182	217	137	118	165	152	153	151	199	172
Greece (see also table below): Saloniki	C	5	4	5																
Guatemala. (See table below.)																				
Hungary	C			5			1				1								4	
Indo-China. (See table below.)																				
Iran	C	16	18	65	22	17	21	18	12	8	15	25	32	28	16	15	15	32		
Teheran	C	1						1							3		1	1		
Iraq:																				
Baghdad	C	1		1																
Sulaimani liwa	C																		1	19
Irish Free State:																				
Cork County—Castletown	C													1						
Waterford County—Lismore	C	1																		
Italy: Leghorn	C	1																		
Japan: Kobe	C	1																		
Latvia. (See table below.)																				
Libya: Tripolitania	C									2			2		2					
Lithuania	C	3	1	15	3	7		9	7	14	6	13	18	8	8	13	21	7		18
Mexico (see also table below):																				
Mexico, D. F.	C	14		36	9	22	19	21	13	8	18	10								
Progreso	D															1				
Saltillo	D	1																		
San Luis Potosi	D	2																		
Torreon	C	5	1	2							1									
Morocco	C		1	17		3	3	1		4	6	14	4	5	3	5		29	26	25
Palestine	C	4			2															
Haifa	C	4	4	4							1	1			1				1	1
Jaffa	C			1	2														1	
Panama Canal Zone. (See table below.)																				
Peru. (See table below.)																				
Poland	C	45	61	124	34	36	60	69	69	82	57	83	84	128	118	114	136	163	128	
	D	5	9	10	3	1	6	7	4	3	8	6	2	11	8					
Portugal (see also table below):																				
Oporto	C			2																
Tarouca (near)	C					26														
Rumania. (See table below.)																				
Straits Settlements. Singapore	C				1							2				1				
Syria	C								1											
Trans-Jordan	C										2			4	2			1	3	4
Tunisia:																				
Tunis	C	1	1	4										1			2	5	9	11
Provinces	C	22	35	56	9	2	18	20	10	14	25	18	7	16	18	14	51	39	62	63
Turkey. (See table below.)																				
Union of South Africa. (See table below.)																				
Union of Soviet Socialist Republics. (See table below.)																				
Yugoslavia. (See table below.)																				
On vessel: SS. *Nosa Prince* at San Francisco	C																1			

[1] For the week ended Mar. 9, 1935, 11 cases of typhus fever were reported at San Jose nitrate camp about 42 miles from Iquique, Chile.

[2] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths, P, present]

Place		October 1934	November 1934	December 1934	January 1935	February 1935	March 1935
Bolivia	C	46	40	103	37	32	43
Chosen	C	22	41	29	55	126	
Czechoslovakia	C			7	15	18	
Greece	C	6	5	15	3	2	
Guatemala	C	18	18	21	31	20	30
Indo-China (French)	C				2		
Latvia	C	3		8	2		
Mexico (see also table above)	C				150		
	D				40		
Panama Canal Zone	C				1	1	
Peru	C	86	52	17	13	32	
Portugal	C	10	8	27	12		
Rumania	C	48	85	127	246	240	
Turkey	C	16	20	32	22	45	56
Union of South Africa:							
Cape Province	C	407	223	103	158	128	
Natal	C	29	4	5	6	4	
Orange Free State	C	403	309	2[illegible]6	133	69	
Transvaal	C	32	39	24	14	16	
Union of Soviet Socialist Republics	C	4,787					
Yugoslavia	C	31	3	17	55	53	102

YELLOW FEVER

[C indicates cases; D, deaths, P, present]

Place		Sept. 30–Oct. 27, 1934	Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Week ended— January 1935: 5	Jan. 12	Jan. 19	Jan. 26	February 1935: 2	Feb. 9	Feb. 16	Feb. 23	March 1935: 2	Mar. 9	Mar. 16	Mar. 23	Mar. 30	April 1935: 6	Apr. 13
Brazil:																			
Goyaz State [1]	D												1		4	1	5	1	1
Mato Grosso State: Coronel Ponce [2]																			
Minas Geraes State [3]																			
Colombia: Intendencia of Meta—																			
Restrepo	C												2						
	D			3	1			3		1									
Villavicencio	D									1									
French Equatorial Africa, Middle Congo—Pointe-Noire	C														2				
Gambia:																			
Bathurst	C		1	2	1														
St. Mary's Island	C		2																

Gold Coast:																			
Aperedi	C					2	1												
	D					1													
Kokobee	C		1																
Oda	C					1													
Wenchi	C		1																
Ivory Coast:																			
Banguoanou	C								1										
Bassam.[3]																			
Bobo-Dioulasso	C	[4] 1										1							
Dibro	C			3															
	D			1															
Diekekro	C			1															
Dimbokro	C						1												
Gagnoa	C												1						
Ouagadougou	C											1							
Tirailleur	C	1																	
Toumodi	C			16															
	D			10															
Zuenoula	C			1															
Nigeria: Kano	C			2	1														
Niger Territory: Zinder	C	1				1													
	D	1																	
Sierra Leone:																			
Freetown	C														1	1			
Hill Station (near Freetown)	C					1													
Togo.[5]																			

[1] For the period Apr. 21 to May 11, 1935, 14 deaths from yellow fever were reported in 8 localities of Goyaz State, Brazil.
[2] During the month of October 1934, 1 case of yellow fever was reported at Coronel Ponce, Mato Grosso State, Brazil.
[3] For the period Apr. 28 to May 11, 1935, 9 deaths from yellow fever were reported in 5 localities of Minas Geraes State, Brazil.
[4] Suspected.
[5] For the period Mar. 11–20, 1935, 1 case of yellow fever with 1 death was reported near Bassam, Ivory Coast.
[6] During the week ended May 11, 1935, yellow fever was reported in Togo, as follows: 1 case at Agoueve, and 1 case at Koumea, Sokode Circle.

X

UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PUBLIC HEALTH REPORTS

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CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES[1]

April 21–May 18, 1935

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease."

Meningococcus meningitis. For the 4 weeks ended May 18 there were 705 cases of meningococcus meningitis, as compared with 659 for the preceding 4 weeks. The increase during the current period was contrary to the usual seasonal expectancy of this disease; in practically every year for which data are available (1913–34), the seasonal peak came in March or April and during the period corresponding to that under report a steady decline was in progress.

In the South Central and Mountain and Pacific sections the disease decreased according to the seasonal expectancy, but in the North Atlantic, North Central, and South Atlantic regions increases in the incidence were reported. In New York the number of cases rose from 83 for the 4 weeks ended April 27 to 104 for the current period; in Missouri, from 33 to 52; in Virginia, from 29 to 46; in Maryland, from 24 to 39; in West Virginia, from 7 to 21. In Texas the number of reported cases dropped from 16 to 4, and in Oklahoma from 23 to 7.

For the entire reporting area the current incidence was more than 3 times that for the corresponding period in each of the 2 preceding years. The number of cases was the highest for this 4-week period since 1930, when 806 cases were reported; and this is true for each geographic area except the South Central. In the South Atlantic section the number of cases (150) was more than 7 times that for the corresponding period last year, while the increases in other regions ranged from 2 to nearly 4 times last year's figures.

[1] From the Office of Statistical Investigations, U. S. Public Health Service. The numbers of States included for the various diseases are as follows: Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 47; diphtheria, 48; scarlet fever, 48; influenza, 44 States and New York City. The District of Columbia is counted as a State in these reports. These summaries include only the 8 important communicable diseases for which the Public Health Service receives regular weekly reports from the State health officers.

The table shows by geographic areas the number of cases reported during 1934-35 in comparison with corresponding periods in the 3 preceding years.

The table indicates a decrease in the number of cases for the week ended May 25 from the weeks included in the current 4-week period.

Meningococcus meningitis cases reported [illegible] each geographic area during 1934-35 [illegible] compared [illegible] for corresponding periods in the 3 preceding years[1]

Year	4-week period ended: Dec. 29	Jan. 26	Feb. 23	Mar. 23	Week ended: Mar. 30	Apr. 6	Apr. 13	Apr. 20	Apr. 27	May 4	May 11	May 18	May 25
Total:[1]													
1934-35	209	[illegible]07	[illegible]	616	173	[illegible]	[illegible]	[illegible]	171	[illegible]	[illegible]	[illegible]	173
1933-34	[illegible]	210	[illegible]	[illegible]	61	[illegible]	[illegible]	61	[illegible]	[illegible]	[illegible]	[illegible]	61
1932-33	241	[illegible]	[illegible]07	[illegible]	[illegible]	[illegible]	75	[illegible]	6	5	[illegible]	17	57
1931-32	[illegible]	[illegible]11	[illegible]	[illegible]	112	[illegible]	91	71	[illegible]	[illegible]	[illegible]	[illegible]	17
New England and Middle Atlantic:													
1934-35	41	12	[illegible]	111	32	[illegible]	22	[illegible]	59	[illegible]	[illegible]	11	[illegible]
1933-34	38	38	10	12	8	11	9	8	[illegible]	13	8	8	15
1932-33	13	[illegible]	[illegible]	63	15	17	21	[illegible]	[illegible]	[illegible]	13	9	17
1931-32	71	91	83	70	33	20	21	25	18	11	19	23	11
East North Central:													
1934-35	41	79	120	119	19	50	16	14	56	45	53	41	12
1933-34	45	60	55	58	27	21	11	24	10	22	13	14	16
1932-33	81	115	86	137	32	36	17	30	20	16	22	22	21
1931-32	85	105	80	98	11	13	38	21	15	25	19	16	8
West North Central:													
1934-35	27	33	81	90	22	22	16	15	17	25	16	25	16
1933-34	18	16	31	26	12	8	11	4	12	7	8	7	11
1932-33	30	53	39	63	10	12	6	12	10	8	10	6	5
1931-32	25	23	39	27	10	5	8	3	6	4	6	9	4
South Atlantic:													
1934-35	25	54	93	121	30	32	25	21	21	30	45	48	27
1933-34	33	25	24	29	10	6	11	14	2	9	6	4	4
1932-33	26	41	43	26	8	6	9	7	9	5	2	1	5
1931-32	24	32	29	34	10	18	8	6	8	10	7	7	7
East and West South Central:													
1934-35	35	67	124	114	28	15	33	25	24	19	18	14	19
1933-34	19	48	47	51	4	11	12	8	10	20	12	9	12
1932-33	34	68	56	60	14	17	16	9	7	9	13	6	3
1931-32	41	33	53	30	9	8	13	13	12	6	12	5	11
Mountain and Pacific:[2]													
1934-35	27	32	55	61	12	20	16	11	17	14	13	10	19
1933-34	19	23	27	19	3	6	4	6	6	1	5	2	6
1932-33	27	27	25	14	10	7	3	7	5	5	3	3	6
1931-32	31	30	31	39	9	5	3	6	10	14	7	5	6

[1] See the Public Health Reports for the issue of May 10, p. 634, for data in 4-week periods for 4 full years, and Apr. 12, 1935, p. 504, for weekly data from Dec. 2, 1934, to Mar. 30, 1935, and corresponding weeks of preceding years.
[2] Exclusive of Nevada.

Poliomyelitis.—The incidence of poliomyelitis (92 cases) increased about 15 percent during the current period over the preceding period. Certain States, however, seemed mostly responsible for the increase. California reported 16 cases, Louisiana 9, North Carolina 7, Washington 6, Virginia and Oklahoma 5 each, while no more than 3 cases were reported from any other State. The current incidence for the country as a whole stood at about the average for recent years, excepting 1934, when an epidemic was in progress at this time in California.

Typhoid fever.—The number of cases (629) of typhoid fever reported for the 4 weeks ended May 18 was the lowest for the corresponding period in recent years. The decreases from last year's figures ranged

from 10 percent in the South Central regions to more than 50 percent in the North Atlantic sections.

Scarlet fever.- During the 4 weeks ended May 18 scarlet fever continued to increase; the incidence rose in Minnesota from 1,131 cases for the 4 weeks ended April 20 to 1,568 for the current period, in North Dakota from 276 to 309, in Nebraska from 174 to 276, and in Utah from 130 to 501. Other States, including Illinois, Wisconsin, Colorado, and the District of Columbia (where the disease has been unusually prevalent), reported significant decreases. For the entire reporting area the number of cases was 27,821, the highest incidence for this period in recent years. Each geographic area except the South Central sections reported more cases than last year. In the South Central regions the current incidence was the lowest in recent years, no State in those areas reporting an unusual prevalence.

Diphtheria. The total number of cases of diphtheria reported for the 4 weeks ended May 18 was 2,044, as compared with 2,190 and 2,033 for the corresponding period in 1934 and 1933, respectively. For the current period the East North Central States reported a 30-percent increase over last year's figure and the South Atlantic group reported approximately the same incidence, but in other sections the number of cases fell considerably below that for the corresponding period last year.

Smallpox. The number of cases of smallpox reported for the current period was 710, of which number Washington State reported 148, Nebraska 115, Kansas 85, Wisconsin 67, California 54, Montana 40, Wyoming 30, and South Dakota and Oregon 24 each. Other States reported only a normal incidence. In Texas the number of cases dropped from 139 for the preceding 4 weeks to 18 for the current period. For the country as a whole the number of cases represented an increase of about 10 percent over the figures for this period in 1934 and 1933, but it was only about 50 percent of the number reported in 1932.

Influenza. The incidence of influenza continued to decline in all sections of the country. For the 4 weeks ended May 18 the cases totaled 3,800, which was about 85 percent of last year's figure for the corresponding period. While the number of cases in the North Central section was not high, the incidence there has been slightly above the seasonal expectancy. Other areas reported a normal incidence.

Measles. The number of cases of measles (123,291) reported for the 4 weeks ended May 18 represented a decrease of approximately 20,000 from the number reported for the preceding 4 weeks. In comparison with preceding years the incidence was still high, almost reaching the level of last year, when the disease was exceptionally prevalent. Apparently the crest of the current wave was passed during the 4 weeks ended April 27, while in the 6 preceding years it

was not reached until the period corresponding to the one now under consideration. The highest incidence in 1926, another year in which measles was unusually prevalent, was reached during the same 4-week period, with approximately 95,000 cases reported. In the New England and Pacific regions the current incidence was the highest for this year, but in all other areas declines were reported. Regions in which the disease has been most prevalent reported very significant increases over last year's figures, but in the South Atlantic and South Central areas the current incidence was very low in comparison with that of last year, when the incidence was high in those sections.

Deaths, all causes. The average death rate from all causes in large cities, as reported by the Bureau of the Census, for the 4 weeks ended May 18 was 12.1 per 1,000 inhabitants (annual basis). The rates for the corresponding periods in the 4 preceding years were 11.8, 11, 11.6, and 11.9, regressively. The current rate was the highest since 1930, when the rate for this period was 12.5. The cause of the increase is not directly apparent, unless it is the result of the unusual prevalence of meningitis, measles, and scarlet fever.

PROTECTION OF MICE AGAINST MENINGOCOCCUS INFECTION BY POLYVALENT ANTIMENINGOCOCCIC SERUM

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Several years ago we reported the production of meningococcus meningitis in rabbits (*1*) and in guinea pigs (*2*) by intracisternal injection of suspensions of virulent meningococci. Some studies were also made with mice; but at that time these animals seemed less interesting, because of the relatively much larger number of bacteria required to infect them. As a rule it was necessary to give a 20 gm mouse, intraperitoneally, at least 5 to 10 times the dose for a 250 gm guinea pig, intracisternally.

Within the last 2 or 3 years really virulent cultures of meningococci have been hard to obtain. The fact that a strain has been immediately isolated from a human case does not mean that it is virulent enough to produce an infection in a rabbit, a guinea pig, or a mouse. About a year ago we received from the Municipal Contagious Disease Hospital in Chicago two strains (524, group I, and 527, group II) which infected mice readily, and our studies with these animals were resumed.

It is well known that virulence is quickly and easily lost in meningococci. Mouse passage proved unreliable as a means of maintaining it; and suitable samples of mucin, for use as described by Miller (*3*), were unavailable at that time. We succeeded in maintaining the

virulence of these two strains for several months, especially strain 527 (II), by cultivating them upon Murray's (*4*) EDB/V medium and storing these cultures at −15° C., according to the method used by Pabst (*5*).

During the winter of 1934–35 there was a sharp increase in incidence of meningococcus meningitis in a number of localities. The city of Baltimore had an unusual number of cases; and through the generous cooperation of Dr. Ewing and Mr. Albaugh, of the laboratories of that city, and from the Johns Hopkins University we have been supplied with strains of high virulence.

Most of these strains belonged to the I-III group, though a few were of group II. In this report certain strains are designated as I or as III. The author has previously expressed the view (*6*) that such strains do not represent two clear-cut groups, and that the designation "I–III" is more nearly correct. This view was expressed by Griffith and by Scott a number of years ago (*7*). However, some strains are more markedly agglutinated by group I serum and others by group III. In this paper we are designating such strains as I or III, as the case may be, and are using the term "I–III" for those strains agglutinated equally by serums representing both groups.

The virulence of our strains for mice was titrated as follows: 18-hour cultures on 5 percent rabbits' blood agar or EDB/V agar slants were suspended in Ringer's solution of pH 7.0. These suspensions were diluted in Ringer's solution until they corresponded in turbidity to silica suspensions of 100 parts per million to 500 parts per million (*8*). Five-tenths cubic centimeter of each dilution was injected into each of three mice intraperitoneally.

The course of the infection in our mice was essentially as described by Miller (*9*), and it is unnecessary to repeat the details here except to note that, in addition to those symptoms observed by him, some of our mice showed definite nervous symptoms, especially convulsions. The majority of the mice died within 24 hours, usually within 6 to 18 hours. There seemed little to be gained by observing them longer than 48 hours. Throughout all of these studies most of our mice were autopsied, a Gram-stained smear was made from the omentum, and a rabbits' blood agar culture was made from the heart blood. Histological examination of the brains of these animals did not reveal any definite meningeal involvement, but merely a hyperemia.

As a rule we discarded all strains which did not kill all mice in a suspension of a density corresponding to 100 parts per million of silica approximately 100,000 meningococci. This seems to be a large number of bacteria to inject, but actually it is much smaller than any heretofore reported with meningococci in animals, with the exception of the recent reports of Miller (*10*) and of Rake (*11*).

The object in studying meningococcus infection in mice was to find a successful method of evaluating therapeutic antimeningococcic serums. Thus, as soon as practicable, a study of the protective action of such serums was begun. These protection experiments were done with the following 10 strains:

Strain no.	Group	Strain no.	Group
521	I	535	I
527	II	536	I
528	III	541	I-III
530	III	544	III
534	III	562	I-III

Suspensions of a density corresponding to 100 parts per million of silica were given intraperitoneally in 0.5 cc amounts per 20 gm mouse. This constituted our standard dose. Since meningococci autolyze quickly in suspension, no suspensions more than a half hour old were used, but fresh ones were made up and control mice injected with each lot. The mortality with these different lots sometimes varied tremendously.

The mice used came from many sources, and the usual variations in conditions and resistance were to be expected. Since no pure breeds of mice were available, it was considered desirable to use a relatively large number of animals. In our experiments either 15 or 20 mice were used for each serum, or serum dilution, and the same number for controls. The mice were kept in large glass jars, 5 mice in each jar.

We have studied 33 polyvalent therapeutic serums, representing 8 manufacturers, 9 samples of normal horse serum from 6 manufacturers, and 7 samples of serum from individual normal horses outside of laboratories. The polyvalent immune serums included 5 antitoxins which at the time were being made for experimental purposes only. These will be designated by (a).

During the earlier experiments the serums were given within one-half hour preceding the injection of meningococci. At first the serums were given intravenously and intraperitoneally to parallel series of mice, 0.5 cc of undiluted serum being used. Table 1 shows the results obtained with 5 polyvalent therapeutic serums with 4 strains of meningococci when given by these two routes. All seemed to show some degree of protection, but serums D, B, and A, all new, were better than E, which was at least 5 years old. There was no consistent difference in the amount of protection afforded by these two routes, as was also found by Miller (*12*), and so subsequently the intraperitoneal route was used.

TABLE 1.—*Comparison of intraperitoneal and intravenous routes of administration of polyvalent antimeningococcic serums to mice within ½ hour prior to intraperitoneal injection of culture*

Experiment no.	Serum	Method used	Strain	Mortality [1]	Agglutinin titer of serum with "type strains" [2]			
				Percent	(I)	(II)	(III)	(IV)
1	A	Intraperitoneal	521 (I)	10	111321	114113	113211	413211
	A	Intravenous	521 (I)	10				
	B	Intraperitoneal	521 (I)	10	331111	341143	311432	211432
	B	Intravenous	521 (I)	10				
	No serum		521 (I)	70				
2	C	Intraperitoneal	527 (II)	30	414311	111113	133211	443211
	C	Intravenous	527 (II)	25				
	D	Intraperitoneal	527 (II)	10	413211	441444	411143	444311
	D	Intravenous	527 (II)	40				
	No serum		527 (II)	83				
3	E	Intraperitoneal	527 (II)	80	222110	441310	331000	443100
	E	Intravenous	527 (II)	80				
	No serum		527 (II)	100				
	F	Intraperitoneally	528 (III)	10				
	F	Intravenous	528 (III)	0				
	No serum		528 (III)	30				
	E	Intraperitoneal	521 (I)	20				
	E	Intravenous	521 (I)	10				
	No serum		521 (I)	40				
	F	Intraperitoneal	530 (III)	20				
	L	Intravenous	530 (III)	40				
	No serum		530 (III)	40				

[1] Each percentage represents 20 mice. ½ cc of undiluted serum preceded 0.5 cc of standard suspension of meningococci.
[2] 4 = complete agglutination, 3, 2, and 1 = varying degrees of agglutination, 0 = no agglutination. 6 serum dilutions from 1:100 to 1:3200.

Following these preliminary experiments, 13 polyvalent serums and 9 normal horse serums were tested for protection of mice against strain 527 (II). As before, 0.5 cc of the serums was given intraperitoneally within one-half hour preceding the injection of meningococci. Table 2 shows the results of these experiments. It can be seen that some of the normal horse serums protected quite as well as, and even better than, some of the polyvalent serums, such as normal A, normal K, and normal O; but, on the other hand, certain of the polyvalent serums afforded very high, and even complete, protection, as, F, I, L, and N. Although 2 of these normal serums were from horses whose history was unknown to us, the other 7 (including the 1 which gave best protection) came from individual horses in our own locality, and it is certain that they had never been given any kind of immunization.

TABLE 2.—*Protection afforded mice by normal and by immune polyvalent serums against infection with a group II strain of meningococcus*

Experiment no.	Serum	Method used	Strain	Mortality [1]	Agglutination titer of serum with types: I	II	III	IV
				Percent				
4	[illegible]	Intraperitoneal	7 (II)	0	[illegible]	[illegible]	[illegible]	[illegible]
	G (a)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	10	[illegible]	[illegible]	[illegible]	[illegible]
	H (a)	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]
	No serum		do	50				
5	I	Intraperitoneal	[illegible]	0	[illegible]	[illegible]	[illegible]	[illegible]
	H (a)	do	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]
	J	do	[illegible]	0	[illegible]	[illegible]	[illegible]	[illegible]
	K (a)	do	do	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Normal A	do	do	10	[illegible]	[illegible]	[illegible]	[illegible]
	Normal K	do	do	10	[illegible]	[illegible]	[illegible]	[illegible]
	No serum		do	70				
6	Normal D	Intraperitoneal	[illegible] (II)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Normal H	do	do	0	[illegible]	[illegible]	[illegible]	[illegible]
	No serum		do	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7	Normal M	Intraperitoneal	[illegible] (II)	10	[illegible]	[illegible]	[illegible]	[illegible]
	Normal N	do	do	10	[illegible]	[illegible]	[illegible]	[illegible]
	Normal O	do	do	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Normal P	do	do	10	[illegible]	[illegible]	[illegible]	[illegible]
	L	do	do	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	M	do	do	10	[illegible]	[illegible]	[illegible]	[illegible]
	No serum		do	60				
8	N	Intraperitoneal	[illegible] (II)	0	[illegible]	[illegible]	[illegible]	[illegible]
	O	do	do	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	M	do	do	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Normal (pool)	do	do	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	No serum		do	75				

[1] Each percentage represents 20 mice.

That the preservatives in the serums had no role in the protection was clearly shown by injecting series of mice with 1 cc of 0.3 percent phenol, 0.3 tricresol, and 1/10,000 merthiolate, the 3 preservatives most commonly used in serums. These mice succumbed to infection as rapidly and in as high a percentage as did the control mice that were given only meningococci in Ringer's solution. The normal horse serums obtained by us locally contained no preservative.

The effect of the length of the interval between the serum and infecting dose was next studied. Five polyvalent serums and one normal horse serum were given to different series of mice 1 hour, 4 hours, 8 hours, 12 hours, and 24 hours before the injection of the culture suspension. Here a difference between the immune and normal serums was more apparent. The results can be seen in table 3. With the polyvalent serums the best protection seems, on the whole, to have been obtained by giving the serum injection 4 hours before the infecting dose. Some of the serums protected well even when given 24 hours before the organisms, as in N; but with others there was practically no protection demonstrable in that interval, as in G (a). The protection afforded by the normal horse serum, normal Q, was the greatest within 1 hour after injection and had practically disappeared after 24 hours.

TABLE 3.—*The effect of the interval between intraperitoneal injections of serum and of culture on protection of mice by antimeningococcic serums*

Experiment no.	Strain	Serum	Mortality in percent to interval between serum and infecting dose [illegible]					Agglutinin titer of serum with "type strain"			
			[illegible] hr	[illegible] hr	[illegible] h	[illegible] hr	[illegible] hr	I	II	III	IV
			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
9	[illegible] (III)	N	[illegible]	0			1[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		I		[illegible]			1[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	60	70			[illegible]				
10	[illegible] (III)	P	1	1	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		G	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		N[illegible]	1	100	[illegible]	80	10				
11	[illegible] (III)	Q		1				[illegible]	[illegible]	[illegible]	[illegible]
		N[illegible]	[illegible]	[illegible]	1		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		N[illegible]	[illegible]	6[illegible]	4[illegible]	[illegible]0	60				

[illegible]

The data shown in table 3 led us to use the 4 hour interval between serum and infecting dose in our next series of experiments. In this way we hoped to get the maximum protection from the immune serums and to avoid the period of greatest protective action of horse serum in itself.

Table 4 shows the results obtained with 11 polyvalent serums and 4 normal horse serums which were given (0.5 cc) intraperitoneally 4 hours before the infecting culture suspension was given by the same route. In these experiments normal horse serum compared very well with the immune serums. With only two strains, 531 (III) and 541 (I III), did the normal serums, normal R and normal S, fail to show what might be interpreted as a protection as great as that afforded by the average immune serum. Complete protection was never obtained with normal serums, however, whereas immune serums afforded complete protection seven times in the experiments shown in this table. Some of the cultures used here were of relatively low virulence, and it is possible that normal serum would show less effect against more invasive strains. In any case the data shown here afford an interesting comparison of the effect produced by different immune serums, all of which, except the antitoxins, had been released for distribution on the basis of the same serological tests.

TABLE 4.—*Protection afforded by serums given intraperitoneally 4 hours before the infecting dose of meningococci by the same route* [1]

Experiment no.	Strain	Serum	Mortality	Agglutinin titer of serum with "type strain," I	II	III	IV
			Percent				
13	536 (I)	R	13	444443	444121	444321	444211
		G (a)	0	444432	311100	110000	000000
		Normal S	6	00	00	00	00
		No serum	26				
	527 (II)	R	26	444443	444121	444321	444211
		G (a)	20	444432	311100	110000	000000
		Normal S	20	00	00	00	00
		No serum	46				
14	534 (III)	S	0	444444	444111	444113	444132
		T	0	444132	444443	333322	444131
		U (a)	20				
		Normal R	60	00	00	00	00
		No serum	70				
	535 (I)	S	0	444444	444111	444443	444132
		T	13	444132	444443	333322	444431
		U (a)	6				
		Normal R	13	00	00	00	00
		No serum	60				
15	534 (III)	V	0	444444	444444	444443	444132
		W	0	444444	444443	444113	444421
		X (a)	10	333321	333211	110000	110000
		Normal R	10	00	00	00	00
		No serum	45				
	535 (I)	V	10	444444	444441	444443	444432
		W	10	444444	444443	444113	444421
		X (a)	5	333321	333211	110000	110000
		Normal R	15	00	00	00	00
		No serum	45				
16	541 (I–III)	Y	13	444443	444444	444443	444421
		Z	27	444432	444412	444312	444321
		AA	6	444442	444443	444432	444321
		Normal R	60	00	00	00	00
		No serum	73				
	544 (III)	Y	20	444443	444444	444443	444421
		Z	20				
		AA	0				
		Normal R	66	00	00	00	00
		No serum	66				

[1] Here 0.5 cc serum and 0.5 cc of standardized suspension per 20-gm mouse were given. Each mortality percentage represents 20 mice.

Thus far all experiments had been done with undiluted serums. A study of the effect of diluting them was now undertaken. Intraperitoneal injections of 0.5 cc of undiluted serum and of dilutions 1:5, 1:10, 1:100, and 1:1,000 were given, and were followed in from 1 to 4 hours by 0.5 cc of a standard meningococcus suspension. Six immune serums and six normal horse serums were used, with meningococcus strain 562 (I III). Table 5 shows the results of these dilution experiments. The normal serums seemed, as a rule, to give protection only when given undiluted, and with normal serums A2 and N none was apparent. Normal O, as in preceding experiments, protected more than most normal horses. This serum was from a horse which had never been injected with anything. On the other hand, most of the polyvalent immune serums showed definite protection in dilutions of 1:100, and some of them in 1:1,000, serums AC and AD especially. With AE and AG a "prezone" would be suggested. By diluting the serums it is apparently possible not only to get an idea of their pro-

tective titer for mice but also to show more clearly the difference between the action of these serums and the effect of normal horse serum. The immune serums definitely offered some protection, but the difference between them and normal serums was not often dramatic.

TABLE 5.—*Protection afforded by various dilutions of immune and normal serums against meningococcus infection in mice*

Experiment no.	Strain	Serum	Serum dilution: Undiluted	1:5	1:10	1:100	1:1000	Agglutination titer of serum with "type strain": I	II	III	IV
			Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*				
17[1]	[illegible] (I III)	Normal A	[illegible]	100	0	100	[illegible]	00	00	00	00
	do	Normal [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	100	[illegible]	[illegible]	[illegible]	00
	do	AB	0	[illegible]	0	40	[illegible]	11[illegible]111	111111	11111[illegible]	[illegible]11112
	do	AC	0	[illegible]	10	10	0	11111[illegible]	111111	1111[illegible]	111[illegible]
	do	No serum	60	60	60	60	100				
18	[illegible] (I III)	Normal [illegible]	10	[illegible]	87	[illegible]	[illegible]	00	00	00	00
	do	Normal H	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	00	[illegible]	00
	do	AD	7	13	7	[illegible]	[illegible]	11111[illegible]	[illegible]1111	11111[illegible]	111111
	do	AI	[illegible]	0	13	[illegible]	[illegible]	111111	111111	11111[illegible]	111111
	do	No serum	80	80	80	80	100				
19	[illegible] (I III)	Normal O	20	[illegible]	30	20	30	00	00	00	00
	do	Normal S	[illegible]	[illegible]	13	[illegible]	10	00	00	00	[illegible]
	do	AI	[illegible]	11	[illegible]	[illegible]	10	[illegible]	111111	[illegible]	[illegible]
	do	A[illegible]	13	0	13	[illegible]	10	[illegible]1322	111111	11111[illegible]	111322
	do	No serum	40	40	40	40	40				

[1] Fewer mice than usual were used with experiment 17, making individual variation more pronounced.

In the tables the agglutination titer of each serum for the "standard" group strains of meningococci is given. It must be remembered that no two strains of meningococci are exactly alike serologically (*6*) and that the recently isolated strains used in these experiments would not behave identically. The four "standard" strains are those used for the routine testing of all commercial therapeutic antimeningococcic sera for polyvalency and agglutinin content. They were chosen from among other strains because they were most nearly comparable to the four type strains originally described by Gordon and Murray (*13*). All of the polyvalent antimeningococcic serums used in these experiments have high agglutinin content for these "standard" strains, have met the Federal requirements, and have been released for distribution. They compare very well among themselves in titer for demonstrable antibodies.

Exceptions to this uniformity are to be found in the 5 antitoxins included here. These were made for experimental use and were not for sale. They were not made with whole culture suspensions and they were not required to have an agglutinin titer equal to that of the Federal standard serum. It is particularly interesting to see, therefore, that the protection afforded by these antitoxins compares well with that of the usual antibacterial serums, especially when the infecting organisms were of group I.

Comparison of the agglutination titer of all of these serums with their protective action is interesting. There is no proof that high agglutinin content means high therapeutic value, yet the serums which have given best protection were usually, though not always, those which had a high titer. In experiment 4 (table 2) serums F, D, and I, having a very high titer for group II, protected excellently against a group II culture; whereas, G(a) and H(a), antitoxins, practically monovalent for group I from the standpoint of agglutinins, protected somewhat less well against the group II culture. On the other hand, in experiment 13 (table 4) this same antitoxin protected completely against a group I culture. Excellent protection associated with consistently high agglutinin content was found in experiments 14 and 15 (table 4) with serums S, T, V, W, and AA; but antitoxin G(a) and X (a), with relatively low agglutinin content, gave good protection with these I–III cultures also. E (experiment 3, table 1) was a very old serum, at least 5 years old, and protected poorly against all cultures tested, but especially poorly against a strain of group II, for which it had the highest agglutinin content. It seems true that a serum high in agglutinins is more likely to protect well than one with a lower titer, although a high agglutinin content does not guarantee a protection, and a serum with a lower titer is not necessarily of less value. Perhaps a high agglutinin titer simply means that the horses have responded well to immunization.

DISCUSSION

Generalized infection with meningococci can readily be produced in mice if the cultures used are sufficiently virulent; and mice may be protected against such infection by many of the polyvalent antimeningococcic serums which are on the market today. Such serums vary widely among themselves in their potency, some protecting completely in dilution of 1:100, and others apparently offering little, if any, more protection than some normal horse serums. As a rule, marked protection was associated with a high agglutinin content of the serum, but this was not an absolute rule.

Several antitoxins included among the serums studied compared very favorably with the better serums in affording protection. Normal horse serum showed a protective action which varied greatly among the samples taken from different horses. Pooled horse serums would be more reliable to use as a "control" than samples from individual horses, and such a "control" should always be included when protection studies with immune serums are being made. Such protection by normal serums is sometimes very pronounced, especially with strains of meningococci of relatively low virulence. As a rule, the protection is striking only when the horse serum is undiluted.

In our experience, serum protects mice better when given before the infecting dose of microorganisms, and we have found 4 hours before administration of the culture to be the most favorable time to give the serum.

The most interesting feature of these studies has been the comparison of the degree of protection offered mice by a number of polyvalent antimeningococcic serums, all of which have met the same serological requirements before being released for distribution. Whether or not the degree of protection afforded mice is a criterion of the therapeutic value of a serum for human cases can be settled only by much more work along this line. The most important requisite for such studies will be a reliable method for enhancing and maintaining the virulence of meningococci for mice in order that strains of a definite infecting power can be used. A promising step in this direction has been made by Miller (*3*). In the studies reported in this paper it has been necessary to change strains frequently in order to keep the fatal dose approximately constant, i. e., 0.5 cc of a suspension of a density comparable to 100 parts per million of silica per 20 gm of mouse. Unless tested pure breeds of mice are available, it will be necessary to use sufficient numbers of them so that individual variation can be minimized. It is necessary to use normal horse serum for controls, a pool from several horses being desirable, as protection by the serum of some horses is pronounced.

These studies with a number of commercially prepared polyvalent serums indicate, as have those of Miller with immune rabbit serums (*12*), those of Rake with monovalent horse serums (*11*), and with the serums from meningococcus carriers (*14*), that the mouse is a suitable animal in which to study meningococcus infection and serum protection.

SUMMARY

A fatal septicemia is readily produced in mice by intraperitoneal injection of sufficiently virulent cultures of meningococci. Studies made in these animals with 33 polyvalent antimeningococcic serums showed a marked protection by a number of them. Five antitoxins that were included compared well with the usual antibacterial serums in protective action. Normal horse serum also afforded a certain amount of protection which varied greatly among individual horses. As a rule the normal serum protected only when given undiluted, whereas some of the immune serums gave protection in dilutions of 1:100 or even higher.

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A REPORT ON AN EPIDEMIC OF TYPHOID FEVER IN A CIRCUS

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HISTORY OF THE OUTBREAK

While a circus[1] was showing in Cincinnati on July 19, 1934, four of its employees, with symptoms suggestive of typhoid, reported to the circus physician for treatment. Widal specimens were taken and left with a Cincinnati laboratory for diagnosis and on July 23 they were reported negative to the physician while at Detroit. On the same day, patients appeared in large numbers with typhoid symptoms at the quarters of the circus physician. Realizing that he was confronted with what appeared to be a typhoid epidemic, he called the Detroit city health department and the Michigan State Department of Health to the scene, and a routine daily temperature check on all circus personnel was instituted. Owing to the interstate character of circus operations, the participation of the United States Public Health Service in the investigation was invited by the Michigan State Department of Health on July 25, 1934.

On July 23, at Detroit, therefore, it became evident that the circus was in the grip of serious outbreak. Sixty-eight of the employees were taken out on July 23 and 24 and sent to the hospital suspected of having typhoid fever. On July 25, at Flint, 9 more were taken out and sent back to the hospital at Detroit, making a total of 77 hospitalized in that city. Of this number, 44 were proved to have typhoid fever. At Lansing, 6 more were taken out, and at Kalamazoo 8. Six of these proved to be typhoid, bringing the total number of typhoid cases hospitalized in Michigan to 50.

The complete list of typhoid suspects hospitalized and the number of cases ultimately proved to be typhoid fever are shown in the accompanying table.

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[1] Ringling Brothers and Barnum and Bailey Circus.

TABLE 1.—*Number of cases hospitalized and number proved to be typhoid fever*

Place	Date	Number hospitalized	Number proved to be typhoid
Detroit, Mich. [illegible]	[illegible]	[illegible]	10
Flint, Mich.	[illegible]	[illegible]	1
[illegible]	[illegible]	6	1
[illegible]	[illegible]	[illegible]	2
[illegible]	[illegible]	[illegible]	1
[illegible]	[illegible]	[illegible]	3
[illegible]	[illegible]	[illegible]	2
[illegible]	[illegible]	1	8
[illegible]	[illegible]	1	3
[illegible]	[illegible]	11	6
[illegible]	[illegible]	1	0
[illegible]	[illegible]	[illegible]	0
[illegible]	[illegible]	[illegible]	1
[illegible]	[illegible]	[illegible]	0
[illegible]	[illegible]	1	0
[illegible]	[illegible]	[illegible]	0
[illegible]	[illegible]	6	1
[illegible]	[illegible]	[illegible]	0
Wichita, Kans.	Aug. [illegible]	1	0
Total		111	74

[illegible]

[illegible] They were completely recovered and ready to be discharged from the hospital [illegible] Two of the [illegible] men were members of the [illegible] "big top" [illegible] canvas group.

[illegible] It would appear that [illegible] developed 8 days after the last previous typhoid cases, but this is not true. She left the show [illegible] on Aug. 2. 10 days later she returned to the show [illegible] in Chicago under treatment by a physician who sent her back to the show [illegible] recovered, with a statement that she did not have typhoid, although she presented a temperature chart characteristic of the disease. It was obvious that she needed further hospital treatment, and she was, therefore, hospitalized at Springfield, Mo. It is understood that she ran a typical course of typhoid, perhaps more severe than usual. The onset of this case, therefore, dates back to Aug. 2 instead of Aug. 11. With the [illegible] it will be noted that the last cases to develop were the 6 left at Madison, Wis., on Aug. 5 and 6.

From the foregoing data it may be concluded that the span of the epidemic covered the period from July 23 to August 6—a total of 14 days. Although the last cases might possibly have been secondaries, it is regarded as more probable that they all derived their infection from the same source as that of the original cases. There appears to be a considerable concentration of cases on August 1, and likewise on August 5 and 6. In the former instance it is believed that the large number hospitalized was due in part to a more rigid investigation of the personnel for suspects, so that part of this number probably should be distributed among the preceding 2 or 3 days. In the latter instance it will be noted that six cases represent the incidence for 2 days instead of one. Actually it represents 3 days, since the suspects found at Oshkosh, Wis., on August 4 were carried over to Madison for hospitalization. While 14 days is the usual period of incubation, it is certainly true that some become ill in a shorter length of time and that in others the appearance of symptoms is delayed much longer than 14 days. In an epidemic such as this, therefore, the appearance of new cases trailing on for some time after the peak of the epidemic is more or less to be ex-

pected and not inconsistent with the idea that the epidemic as a whole had its origin in one and the same source of infection.

In approaching the study of this epidemic it is necessary to adjust one's viewpoint to the unique circumstances under which a circus operates. Being constantly on the move, the circus is subjected to an entirely different set of local surroundings each day, or at least at each stand. Not only is this true, but the circus equipment and circus customs are based on the principle of constant mobility.

The following is a list of cities visited after the circus left Madison Square Garden in New York, beginning with June 11, 1934, and ending on August 17, 1934:

June 11, Poughkeepsie, N. Y.
June 12, Waterbury, Conn.
June 13, New Haven, Conn.
June 14, Hartford, Conn.
June 15, Stamford, Conn.
June 16, Bridgeport, Conn.
June 17, Sunday.
June 18, Providence, R. I.
June 19, New Bedford, Mass.
June 20, Fall River, Mass.
June 21, Worcester, Mass.
June 22, Manchester, N. H.
June 23, Springfield, Mass.
June 24, Sunday.
June 25, Albany, N. Y.
June 26, Schenectady, N. Y.
June 27, Syracuse, N. Y.
June 28, Geneva, N. Y.
June 29, Rochester, N. Y.
June 30, Niagara Falls, N. Y.
July 1, Sunday.
July 2, Buffalo, N. Y.
July 3, Jamestown, N. Y.
July 4, Bradford, Pa.
July 5, Allegheny, Pa.
July 6, Pittsburgh, Pa.
July 7, Pittsburgh, Pa.
July 8, Sunday.
July 9, Washington, Pa.
July 10, Wheeling, W. Va.
July 11, Akron, Ohio.
July 12, Youngstown, Ohio.
July 13, New Castle, Pa.
July 14, Erie, Pa.
July 15, Sunday.
July 16, Cleveland, Ohio.
July 17, Cleveland, Ohio.
July 18, Columbus, Ohio.
July 19, Cincinnati, Ohio.
July 20, Dayton, Ohio.
July 21, Toledo, Ohio.
July 22, Detroit, Mich.
July 23, Detroit, Mich.
July 24, Detroit, Mich.
July 25, Flint, Mich.
July 26, Lansing, Mich.
July 27, Kalamazoo, Mich.
July 28, Fort Wayne, Ind.
July 29, Sunday.
July 30, Louisville, Ky.
July 31, Indianapolis, Ind.
Aug. 1, South Bend, Ind.
Aug. 2, Evanston, Ill.
Aug. 3, Milwaukee, Wis.
Aug. 4, Oshkosh, Wis.
Aug. 5, Sunday.
Aug. 6, Madison, Wis.
Aug. 7, Freeport, Ill.
Aug. 8, Davenport, Iowa.
Aug. 9, Peoria, Ill.
Aug. 10, Springfield, Ill.
Aug. 11, St. Louis, Mo.
Aug. 12, St. Louis, Mo.
Aug. 13, Jefferson City, Mo.
Aug. 14, Kansas City, Mo.
Aug. 15, Springfield, Mo.
Aug. 16, Tulsa, Okla.
Aug. 17, Oklahoma City, Okla.

The health status of the show pursued an even course until about July 7, when an explosive outbreak of acute diarrheal enteritis occurred, affecting more or less the entire circus personnel and reaching its peak about July 9. It should be noted that, in circus experience, diarrhea is not at all uncommon, and so the appearance of a few

cases of diarrhea would not be likely to attract any particular attention. At that time, however, the incidence of diarrhea was such as to create a profound impression upon all groups of the show people. Although a record of all cases applying for medical treatment at that time is not available, the circus physician estimates that from 50 to 70 percent of the entire personnel was affected with acute diarrhea, lasting in most instances from 1 to 2 or 3 days, though a few lasted longer. Upon the subsidence of this trouble, nothing further happened until July 16, when one patient felt sick enough to be confined to bed. This patient did not give a history of previous diarrhea, but dated the onset of illness from July 14, as did several others who were not hospitalized until July 23 or 24. The fact that this patient went to bed on July 16, about a week in advance of the main exodus at Detroit, is not regarded as having any significance aside from the probability that he surrendered to his feelings more quickly than the others. It will be noted that, among those hospitalized at Detroit, 11 complained of continuous illness, dating back to the diarrhea epidemic of July 7, 8, and 9.

The next incident was the taking of four Widals at Cincinnati on July 19, the complaints and symptoms of these patients being such as to raise a suspicion of typhoid. The fact that these were all reported negative is readily explained on the ground that they were taken so early in the course of the disease that antibodies had not yet been formed, thus indicating unusual alertness on the part of the circus physician.

On the following day, July 20, at Dayton, an usher complained of feeling ill and asked to be paid off, saying that Dayton was his home and he wanted to remain there. Subsequently the circus was informed that this man died on July 23, though it is not known definitely whether he had typhoid.

The foregoing description of the epidemic of enteritis is given as it is believed to be a significant antecedent to the typhoid epidemic, the onset of which definitely dated from July 22.

A tabulated summary of the case histories of the first 50 cases, prepared by the Michigan State Department of Health, is presented in table 2. This table also includes 24 cases that developed subsequently, although the data on these cases are somewhat abridged.

The curve representing the chronological hospitalization record of typhoid suspects and cases, together with graphic presentation of the number of diarrhea cases in the period July 7, 8, 9, and the number having diarrhea during that period among those hospitalized at Detroit, is shown in chart 1.

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EPIDEMIOLOGICAL DATA

From a study of these data the following facts are deduced:

1. *Age.*—Ages range from 15 to 55, the average being 26.3.

2. *Sex.*—There are 8 females and 66 males, which is approximately the same ratio as exists between males and females throughout the circus.

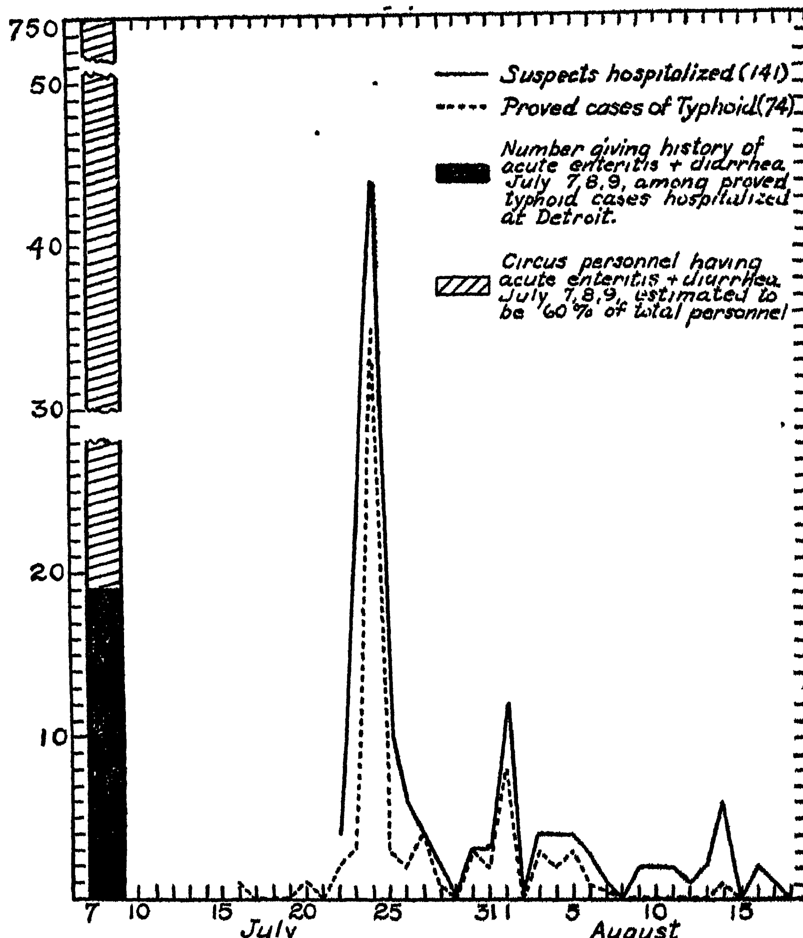


CHART 1.—Chronological hospitalization record and number of cases with history of enteritis and diarrhea

3. *Race.*—There are 4 colored, 1 Chinese, and 69 white. The ratio of colored to white in the entire circus personnel is not known, but it is thought to be approximately as above.

4. *Groups affected.*—The circus is a highly departmentalized institution. Classification into 23 separate groups would seem to be sufficient to provide a very specific designation for each group.

Certain group designations, however, are still rather general and, for a clear conception, should be further subdivided. Cookhouse employees, for instance, include all who are in any way engaged in the handling of dishes and the preparation and serving of food — cooks, flunkies, waiters, and dishwashers. In a study of this kind it makes a great deal of difference as to the exact duties of the infected person about the "cookhouse." Although the record is not specific as regards the duties of certain cookhouse employees, it is known that only two of the cookhouse group were employed in the kitchen, which is the only source from which the entire personnel could have received contaminated food. One of these, Van Moore, was a kitchen helper and the other, Louis Graf, a cookhouse flunky, which probably means the same as kitchen helper. These men became ill simultaneously with the large draft of cases hospitalized at Detroit, and consequently, it must be assumed that they received their infection at the same time as the others, rather than being themselves the source of infection to those with whom they were hospitalized.

The canvas groups are divided into three branches Whalen's men, 225; Snellen's men, 55; and side-show canvas, 21. In the classification employed in this study, the first two groups have been combined to include workers on the "big-top" and all other canvas except the side show, which is a distinct unit.

Under the classification of "performers" there is a wide range of employees aerialists, acrobats, wire walkers, equestrians, animal trainers, ringmasters, wild-west performers, clowns, musicians, and side-show freaks. Among the performers affected, those subjected to excessive muscular exercise, and high temperatures, high up in the "big top", are the groups who were specially hard hit. These are the persons who are said to consume enormous amounts of water when their acts are finished.

The designations of the other groups are sufficiently specific as to require no special comment.

Table 3 shows the total number in each classification, the number of typhoid cases in each group, and the percentage of the group affected with typhoid, the percentage of the circus personnel represented by each group, and the percentage of total cases occurring in each group. Charts 2 and 3 are graphic representations of these factors.

The only large groups that escaped were the train crew, porters, and elephant men. It should be noted that the trainmen and porters are practically isolated from the rest of the show except for eating in the circus dining rooms. The water supplied to the tanks on the trains is usually separate from that of the rest of the circus, being secured from hydrants that furnish water to Pullman cars. The drinking

water on the cars was formerly secured, in large part, if not wholly, from ice placed in the coolers and allowed to melt. Thus it is seen that the water drunk by the trainmen and porters was either melted ice or water from an approved Pullman car supply. The facts, therefore, seem to be opposed to the idea of a food-borne typhoid epidemic, since the train crew and porters ate in the circus dining rooms. The idea of water-borne infection, however, involving the main body of the circus, but not the trainmen and porters, who drink from a separate source, is highly suggestive.

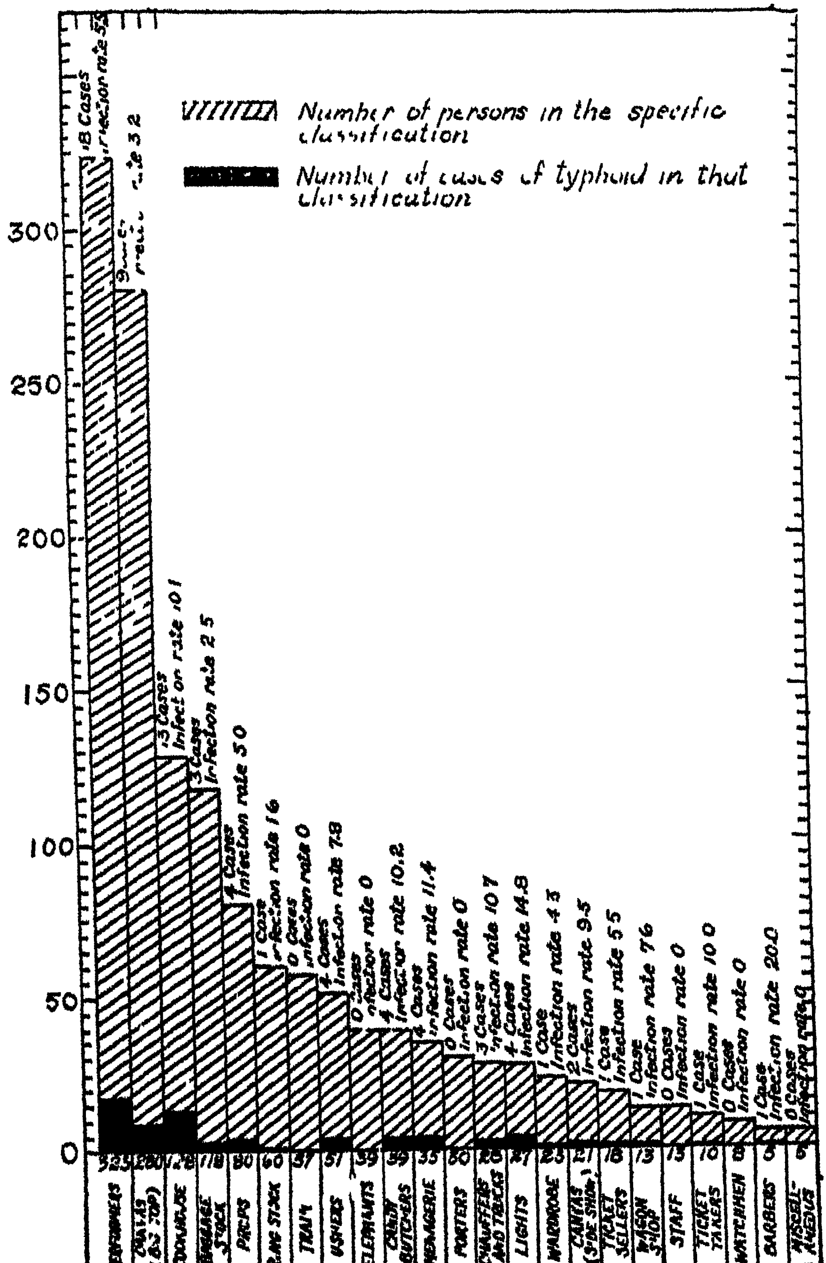
TABLE 3.—*Data according to employee group*

Classification	No.	Number of cases	Infection rate	Percent of circus population	Percent of cases
Performers	323	18	5.5	22.9	24.4
Canvas (big top)	240	9	3.2	19.9	12.3
Cookhouse	128	13	10.1	9.2	17.6
Baggage stock	118	3	2.5	8.4	4.1
Props	80	4	5.0	5.7	5.4
Ring stock	60	1	1.6	4.3	1.3
Train	57	0	0	4.1	0
Ushers	51	4	7.8	3.7	5.4
Elephants	39	0	0	2.8	0
Candy "butchers"	39	4	10.2	2.8	5.4
Menagerie	35	4	11.4	2.5	5.4
Porters	30	0	0	2.1	0
Chauffeurs and truckmen	28	3	10.7	1.9	4.1
Lights	27	4	14.8	1.9	5.4
Wardrobe	23	1	4.3	1.6	1.3
Canvas (side show)	21	2	9.5	1.4	2.7
Ticket sellers	18	1	5.5	1.2	1.3
Wagon shop	13	1	7.6	.9	1.3
Staff	13	0	0	.9	0
Ticket takers	10	1	10.0	.7	1.3
Watchmen	8	0	0	.5	0
Barbers	5	1	20.0	.3	1.3
Miscellaneous	5	0	0	.3	0
Total	1,411	74	5.24	100	100

The largest number of cases, as might be expected, was among the largest group; namely, the performers. These cases may be subgrouped more specifically as follows:

Aerialist	3	Clown	3
Wire walker	3	Side show	2
Bar performer	1	Silver statue	1
Acrobat	2	Colored band	1
Performer (unclassified, probably aerialists)	2	Total	18

Every type of performer is represented in the foregoing list. The aerialists and wire walkers are not large groups, but they account for a possible 8 out of the 18 cases in the performer group. These are the groups subjected to excessive heat high up in the big top. It is said that the temperature commonly reached 135° F. on the high wires in July and August. The infection rate among the performer group as a whole, however, was only 5.5 percent, which is only slightly above that of the whole circus.



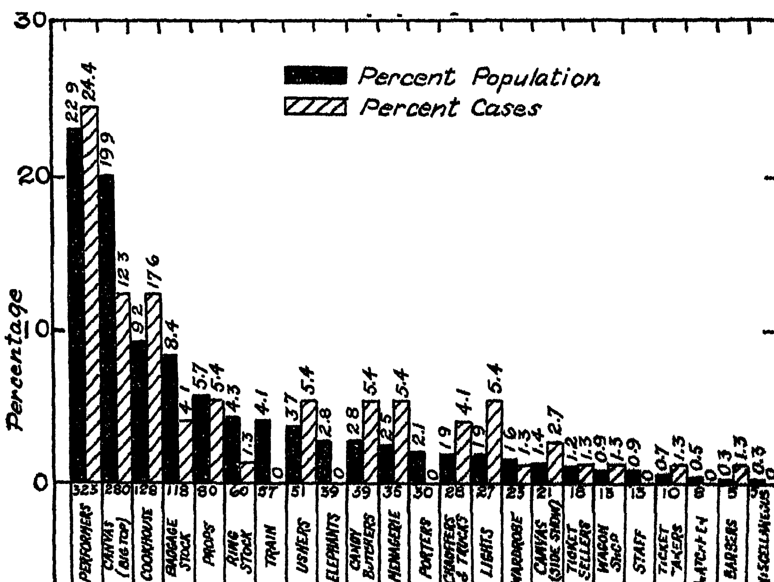
CLASSIFICATION OF EMPLOYEES IN RINGLING BROS—BARNUM AND BAILEY CIRCUS, THE NUMBER OF PERSONS IN EACH CLASSIFICATION, AND THE NUMBER OF CASES OF TYPHOID IN EACH GROUP.

CHART 2.

The next highest number of cases is contributed by the cookhouse personnel. With less than 10 percent of the population, they account for 17.5 percent of the cases, and the infection rate among them is 10.1 percent. Cases among cookhouse employees occurred simultaneously with the other cases, and so they could not have been involved in originating the epidemic.

Although second in number of personnel, the "big top" canvas group is third in number of cases. With a number representing 19.9 percent of the total circus population, the percentage of cases among them was 12.1 percent, and the infection rate 3.2 percent.

In the next largest group, the baggage stock, the infection rate is low, 2.5 percent. With this may be considered the ring stock, which



PER CENT OF CIRCUS POPULATION REPRESENTED IN EACH CLASSIFIED GROUP, AND PER CENT OF TOTAL TYPHOID CASES CHARGED TO EACH GROUP — RINGLING BROS.–BARNUM AND BAILEY CIRCUS.

CHART 3

is a closely allied group. The infection rate there is still lower, being 1.6 percent.

The 39 elephant men live and work under conditions which appear to be identical with those under which the menagerie men live and work. There is, therefore, no assignable reason why the elephant group had no cases, while the menagerie men had four.

Aside from the train crew and porters, regarding whom comment has already been made, the case incidence among the remaining groups runs as closely parallel with the case incidence in the circus as a whole as could be expected in view of the small number in the groups involved.

Although the number of cases and the infection rates in the larger units present certain variations, as pointed out above, these differences are believed to be not inconsistent with the chances of morbidity resulting from infection common to all. In fact the outstanding characteristic of this epidemic is the uniformity of distribution of cases among the several groups of the circus personnel.

5. *The distribution* as to train section and car shows nothing significant.

6. *Date of onset of illness.* This item is meant to indicate the date from which the patient traced continuous illness prior to being put to bed. Eleven date their continuous illness back to the period July 7 to 9, which is coincident with the general epidemic of diarrhea.

7. *The dates of confinement to bed* are as follows:

	No.		No.
July 16	1	July 28	2
July 22	2	July 30	3
July 23	3	July 31	2
July 24	35	Aug. 1	8
July 25	3	Aug. 2	1
July 26	2	Aug. 3	3
July 27	2	Aug. 5 and 6	6

Date of first diarrhea as pointed out above shows that 19 gave positive history of having had diarrhea in the period of July 7 to 9, and that in 11 of these, symptoms of illness were continuous up to the time of hospitalization for typhoid.

9. *The time away from the circus* is of value only as negative evidence. It will be noted that only 1 person had been away from the circus since the season opened, and for only 1 day, many days previous to probable date of the generalized infection.

10. *The dining room.* It will be noted that the circus operates 3 dining rooms 1 for performers, ushers, musicians, and executive personnel; 1 for white laborers; and 1 for colored laborers. It is only in the performers' dining room that a spotting of cases as to tables and waiters can be done. In this dining room each person has his own place to eat and no one else is ever served at that place, and each waiter serves two specific tables only. In the other dining rooms, however, there is no regularity as to seating. A spotting of cases at tables in the performers' dining room shows that the distribution is more or less general and that there is no concentration at any one table that could be considered significant, with the possible exception of table 5. (See table diagram, chart 4.) Four of the five persons at this table who became ill were females, and at least three of the number were from the same family. There is, however, nothing that can be connected with these cases to give them any special interest from an epidemiological standpoint. The waiter at their table was found negative upon examination for typhoid carrier, and he did not de-

velop the disease. Moreover, as noted above, each waiter served 2 parallel tables, beginning at the entrance end of the dining room, as tables 1 and 2, 3 and 4, and so forth. Therefore, the same waiter who served table 5 also served table 6, which had no cases at all. In like manner, table 3 had two cases, but table 4, which was served by the same waiter, had none. In only two instances are cases found at both tables served by any one waiter. It is, therefore, highly improbable that infected waiters had anything to do with transmission of typhoid in the performers' dining room.

11. *Drinking water.* The records are not complete regarding the places of drinking and water-drinking habits. The data, however, are sufficient to show that water drinking was not limited to any one

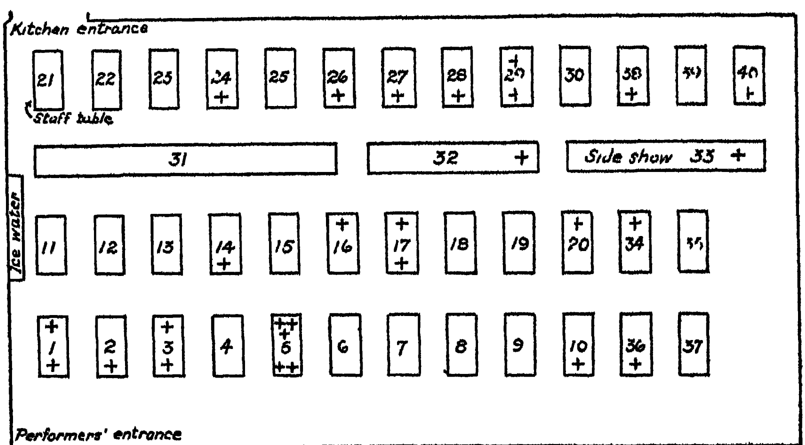


TABLE ARRANGEMENT IN PERFORMERS DINING ROOM—RINGLING BROS CIRCUS

CHART 4.—Table arrangement and distribution of cases (represented by crosses)

common dispensing point. It has been ascertained that the performers, after strenuous exercise in high temperatures, consume an unusual amount of water. The same is said to be true of the cookhouse group, who are subjected to the extra heat of the kitchen.

12. *Eating habits.* The four columns in table 2 pertaining to eating habits may be considered together. There was formerly what was known as the "back door" restaurant, where employees might secure food, particularly after the cookhouse had been taken down. Also there was a lunch wagon at the front of, or near the entrance to, the circus, from which accessory meals could be secured. These two sources of food were operated by a food concession and moved along with the circus; they were not conducted by the circus. A "pie car" was attached to the train, from which food might be secured en route. All the evidence as to accessory meals secured from the circus and from outside restaurants is consistent in showing that no infection from any of these sources could have been common to all the patients.

13. *Length of time with the circus.* It is noted that 43 employees joined the circus at or near the beginning of the season, and that the last one to join did so on July 7 at 7 p. m. This man became ill on July 18 and was put to bed with clinical symptoms of typhoid on July 23. This case is regarded as especially significant in fixing the date of the generalized infection on or soon after July 7.

From the foregoing it would appear that the circus personnel as a whole, rather than any isolated group or groups, were subjected to the primary infection simultaneously. Since the infection must gain access to the alimentary tract through the mouth, we must account for some way in which food or water could have become contaminated so as to affect all groups more or less uniformly.

Food is purchased locally at each stand, from the larger dealers, in quantity sufficient only for the day or days at that stand. Any high pollution in the general food supply furnished the circus, therefore, would be expected to give rise to an increased incidence of morbidity in the local community where food from the same source is consumed. There was no indication of excessive diarrhea or typhoid on corresponding dates in the communities visited by the circus.

Food handlers naturally call for close scrutiny because of the possible presence of typhoid carriers. In this classification, including about 200 persons, were the cooks and waiters serving the circus personnel, all food concession men, and all who came in contact with the handling and dispensing of water. Stool examinations were made as follows:

1. *First series:*
   (*a*) At Louisville (Ky.) State laboratory, 100 (approx.); all reported negative.
   (*b*) At Indianapolis (Ind.) State laboratory, 100 (approx.); 2 reported positive. These were waiters in the laborer's dining room. As soon as they were discovered, they were promptly discharged and sent home. Both were subsequently negative.
2. *Second series.*
   At Madison, Wis., stool specimens from the entire food handlers' group (about 200), including the 2 reported positive at Indianapolis, were taken and examined in the State laboratory. All specimens were reported negative.
3. *Third series.*
   (*a*) About one third taken at Jefferson City, Mo., and examined in the State laboratory. All were reported negative.
   (*b*) The remainder (128) were taken in Denver and examined in the State laboratory of Colorado. Of this number, 19 were reported positive. All these were promptly sent home with instructions to report to the local health officer, and the local health officer was notified. All but one did report to the local health officer, and all who reported had subsequent stool cultures made. All such cultures have been reported negative. It is understood that only one of this number had had at any time a rise of temperature or reported to the doctor's office for treatment. This man had an upper respiratory infection.

> In this connection it should be observed that no small difficulty was encountered in designating cases for hospitalization on the basis of temperature elevations, due to the great prevalence of upper respiratory infections and reactions from typhoid inoculation.

The foregoing serves to show the erratic nature of stool cultures. Up to the time of the Denver report, the discrepancies can be readily harmonized; but the finding of 19 positive out of about two-thirds of the group, and the failure to confirm any of these on subsequent examinations would seem to place the burden of proof upon the Denver laboratory.

The presence of a carrier or carriers among the waiters could not account for the epidemic, as each waiter served only a small group of persons. It is noted in this connection that the dining room from which the greatest number of typhoid-infected waiters were taken was the laborers' dining room; and yet among the laborers the incidence of typhoid was lower than in any other large group. If the infection had come from carriers or infected waiters, the greatest number of cases should have been found among the laborers, not only because the greatest number of infected waiters came from the white laborers' dining room, but because it was here only that any given carrier could have infected more than the normal seating capacity of his table. It has been previously pointed out that, in the laborers' dining room, there is no fixed seating plan carried out, as is the case in the performers' dining room, and so it would have been theoretically possible within a few days' time for any given waiter to have served all the white laborers. Of the two food handlers reported by the Indiana State laboratory as positive for typhoid, one was a colored waiter employed in general service in the colored dining room, while the other worked at the steam table in the white working men's side (long end). A third man reported as positive for dysentery bacillus served soup to the white working men. The only place where a typhoid carrier could affect the entire circus personnel would be in the kitchen. It is interesting to note that the incidence of illness in the kitchen personnel is extremely low, there being only two cases of typhoid found in that group. But, assuming that there were carriers in the kitchen, it is noteworthy that typhoid did not occur prior to the present epidemic.

The circus had been on the road for about 3 months before the appearance of sickness, with exceedingly small turn-over in the kitchen personnel. With a carrier in the kitchen the distribution would almost certainly have been quite irregular with respect to different groups and classifications in the circus.

An investigation as to purchase of certain foods, such as lettuce, celery, and cabbage, does not reveal anything significant. Fresh milk can be readily ruled out for the reason that its use is not general. Among the few who did use it there were no cases of typhoid.

Ice has also been considered as a possible source of infection. During the hot summer months, ice is used in large quantities, averaging around 10,000 pounds per day. It is, moreover, an article used in common by all, in ice water, table beverages, and the drinking water derived from melted ice in the coolers on the sleeping cars. In the last-named instance any infection that might have been present would have been in concentrated form, whereas it would be subject to considerable dilution in all others. Contaminated ice, therefore, would be expected to give rise to the heaviest typhoid infection among the train crew and porters, whose drinking water was derived almost wholly from melted ice. There were no cases of typhoid, however, among these two groups. The use of natural or lake ice is of special interest as a possible source of infection. According to the records, natural ice was used only at Geneva, N. Y., on June 28, about 10 days prior to the epidemic of dysentery and 24 days prior to the outbreak of typhoid.

Since food and ice contamination can apparently be dismissed as quite improbable, if not impossible, the study narrows down to a consideration of water. Certainly this is an article used in common by all, and during the hot weather in very large quantity. Moreover, the whole picture is typically that of an epidemic due to water from some highly polluted source. There is first the vast crop of diarrheal cases due, perhaps, to colon bacillus, or some other sewage organisms; then, after the usual interval of about 14 days, comes the typhoid epidemic in full force; and finally, the straggling incidence of cases for about 2 weeks following the peak of the epidemic.

Here again the same question arises as with contaminated food supplies; namely, How could the circus personnel become affected from a public water supply while the local community was free? In some cities, and especially in highly industrialized areas, there are 2 water supplies, 1 for drinking and domestic use and 1 for fire protection. The latter is commonly raw, untreated water which may be highly polluted. The water supply for a given day might have been derived by mistake from such an accessory supply. One of the most dangerous practices in the public water supply business is the use of cross connections between the domestic supply and the raw, untreated accessory fire protection supply. It is entirely possible that the water supply might have been derived from a domestic supply hydrant but had become polluted by drawing raw water through a nearby leaky cross connection. The usual location of the circus lot is far removed from the residential section of a city. It is, therefore, probable that infection might have been picked up in the manner indicated without similar infection appearing among local domestic consumers. Another possibility, which, however, could appear to be remote is that the water might have been drawn from a dead-end water main lying

in close proximity to a leaky sewer. In this case there would also have to be a leaky joint in the water main through which the pollution could be sucked in when the water was being taken from the water line.

Bathing in a polluted stream has been advanced as still another possible explanation of the infection. Assuming that the outbreak of diarrhea was in any way connected with the typhoid epidemic, this theory would presuppose that at least 60 percent of the circus personnel on the same day went in bathing in the same polluted water, and that all of them got an appreciable amount of polluted water into the alimentary tract. It is hardly conceivable that such a large proportion of the circus personnel should suddenly decide to go bathing in a polluted body of water not frequented by the public generally. But granting this as being possible, it is certainly contrary to all experience and even to common sense to assume that all of them ingested polluted water. Furthermore, this theory presupposes that, since practically all groups were affected with diarrhea or typhoid, practically all groups went in bathing together. This is contrary to social custom and standards in the circus. Moreover, if this theory were correct, it would indicate that not only did 60 percent go in bathing, and that all of these took into the alimentary tract polluted water, but that the infection rate for diarrhea was 100 percent and the rate for typhoid was approximately 10 percent. Both of these latter concepts are quite untenable. Finally, although this inquiry was not made in the original epidemiological study, questioning of circus employees gave conclusive evidence that this theory was also contrary to fact.

SANITARY EQUIPMENT AND PRACTICE

The Ringling Circus has been in operation for over 50 years, during which time it is said that only one epidemic occurred among the circus personnel. This was a smallpox epidemic in Mexico about 1910. Since that time no one has been permitted to join the circus without proper smallpox vaccination. Having encountered no troubles heretofore in which faulty sanitation was particularly involved, sanitary factors had never been brought under critical study. The circus is perhaps dominated by traditional custom more than any other great enterprise. Being a little self-contained world of its own, the circus has perpetuated outgrown sanitary practices without being influenced by modern sanitary advancement.

In order to give a picture of the sanitary situation as it existed prior to the typhoid epidemic, the findings of the sanitary survey made on July 26 are presented in the following:

1. WATER (SOURCE)

The advance men, or so called "24-hour men", make a contract in each city for water to be furnished on the day or days that the circus is to be at that locality. Usually it is a municipally owned water supply, but sometimes it is one owned by a private water company under municipal control. No specifications as to standard of purity were included in the contract.

Water on the circus grounds is used for the following purposes: (*a*) For drinking water and other domestic use in the cookhouse and about the grounds; (*b*) for watering the animals; and (*c*) for sprinkling. Safety of the water is much less essential for the latter two purposes than for the first, except for the fact that men in the horse "tops" commonly drink from the same bucket from which the horses are served. All tanks on wagons and trucks on the circus grounds were filled from the top by means of a fire hose inserted into the tank.

The method of serving drinking water was found to be exceedingly crude in most instances, the prevail ng custom being to use a barrel, keg, or bucket with ice immersed in the water, and the water was served to the individual by means of a common dipper or cup.

Water on the sleeping cars.—Each sleeping car is equipped with overhead tanks averaging about 300 gallons per car. Water from these tanks is said to have been used for lavatory purposes only. These tanks are filled ordinarily from the railroad yard supply, which is separate from that from which the circus lot supply is derived. Water for filling the car tanks is secured by means of direct hose-to-hose connection with the city supply. There is a permanent hose line installed on top of cars so that the nozzles emptying into the storage tanks never come in contact with surface dirt or filth.

Drinking water on the cars was said to be derived entirely from ice placed in the coolers and allowed to melt. There are abundant indications, however, that, during the extremely hot weather, the melting ice did not furnish sufficient water to meet the demands, and that it was supplemented by water from storage tanks, which was in all probability safer for drinking purposes than water from melted ice, as the ice was necessarily subjected to contamination by handling. Water drawn from the coolers was served to the individuals by means of cups and glasses used more or less in common with the other occupants of the car.

2. LATRINES (ON THE CIRCUS GROUNDS)

Nothing worthy of the name of latrine was found. It was customary to dig a shallow trench or none at all over which was installed a straddle bar or, in a few instances, a seat arrangement, with no attempt to exclude flies. The principal function of the so-called

"latrine", however, was to afford privacy from public view by means of canvas side walls.

Toilet facilities on the cars.—The cars were equipped with galvanized iron buckets swung under each toilet commode for use when the cars were parked. No disinfectant or fly repellant was used. The contents of these containers were supposed to be disposed of by earth burial, but there are grounds for speculation as to the efficiency of this service.

3. COOKHOUSE

(*a*) *Dishwashing.*—The equipment in each instance consisted of 2 tubs of water, 1 for washing the dishes and 1 for rinsing. The temperature of the water was ordinarily little more than lukewarm. Both wash and rinse water became heavily charged with food particles, so that the solution commonly resembled a thick soup. Dishes withdrawn from the rinse water were seen to have numerous food particles still clinging to them. Dish towels soon became water-soaked and laden with grease and food particles.

(*b*) *Protection against flies.*—Bread and other food supplies on the tables and in the kitchen were not sufficiently guarded against flies.

(*c*) *Food handlers.*—Cleanliness of outer garments and personal cleanliness were found considerably below standard. The custom in serving meats and many other foods to the plates was by the hands direct, without the use of serving forks or other suitable instruments. Physical examination of food handlers had not been carried out and no stool examinations for typhoid carriers had been made. Mixed garbage and refuse of all kinds were disposed of by dumping on the surface of the ground.

4. TYPHOID INOCULATION

No effort had been made to require or encourage individual antityphoid prophylaxis. Only 143 gave history of previous typhoid inoculation.

SANITARY MEASURES INSTITUTED

Although the findings fail to indicate any source within the circus itself which cou d have been held responsible for the epidemic, the following sanitary measures were instituted by the circus management, upon recommendation of officers of the United States Public Health Service, to safeguard against secondary cases and provide the maximum protection for the future through precautionary practices applicable to conditions under which the circus operates:

1, The advance men were required to secure statements from the local health officer certifying that the water supply conforms to the standards for interstate traffic, that the ice contracted for is from an approved source, and that the milk is of a safe quality and pasteurized.

2. Water was required to be taken only from hydrants designated by a responsible employee of the water company and opened by him personally or by his representative.

3. Water tanks were remodeled so as to prevent the insertion of a hose into the tank.

4. All water tanks, storage tanks on cars, and cooler tanks were chlorinated once each week.

5. All containers for dispensing drinking water were replaced by covered coolers with spigots. The coolers were so constructed that ice should not come in contact with the drinking water.

6. The common dipper or cup was prohibited, and replaced by single service paper cups.

7. Each unit of the circus was equipped with adequate latrine facilities. Also suitable latrines were provided for public use. The latrines consist of an earth pit, usually 3 feet deep, and covered at the top by a collapsible fly-proof steel latrine seat. When placed over the latrine pit the earth is banked around where the bottom rests upon the ground so as to insure against the entrance of flies. The seat openings are covered with fly-tight lids. Sufficient chloride of lime is used so as to repel flies, destroy odors, and disinfect the latrine contents. In the men's latrines there is an accessory urinal trench, which also is generously treated with chloride of lime. These latrines were placed under constant supervision by circus attendants. The location of these latrines must be satisfactory to the local health officer.

8. In the cookhouse, temporary improvement in the dishwashing arrangements was effected by requiring all dishes, after being rinsed, to be passed through a chlorine sterilizing bath. As a permanent measure, however, the order was placed for a dishwashing machine to be mounted in a special truck, together with its own power unit and water tanks, whereby hot and cold water can be supplied under pressure. This unit was delivered at St. Louis on August 11, and is reported to have been in constant and efficient use ever since.

Food on the table and in the kitchen was guarded against flies by coverings insofar as practicable.

Food handlers were placed under rigid supervision as regards clothing and personal cleanliness. The serving of foods by means of proper utensils was required. All food handlers were physically examined for tuberculosis, venereal disease in communicable form, and all other communicable diseases. In addition, two samples of stools and urine were taken from each to rule out any typhoid carriers. All reported positive were immediately discharged and returned home in custody of local health officers.

As regards garbage disposal, the first requirement was a separation of food refuse from tin cans and combustible material. The latter was

burned before the site was abandoned. For the food refuse, an earth pit of suitable proportions was dug near the kitchen. The garbage during the day was deposited in this pit, which was covered over with earth at the end of the day. In some cities the garbage was deposited directly into garbage trucks furnished by the city.

The entire circus personnel was subjected to antityphoid inoculation.

As a surety that every phase of health protection for the circus personnel and the public will be adequately guarded in the future, the circus engaged two additional employees for the remainder of the season. One of these is a medical man to have charge of the medical phases of health protection, and the other a highly trained and experienced sanitary supervisor.

For the future guidance of the circus regimen along sanitary lines a set of standard sanitary regulations was drawn up. These regulations are presented in the appendix.

SUMMARY

(1) In the early part of July there occurred among the employees of the circus an extensive epidemic of diarrhea having all the characteristics of so-called winter cholera, which was followed 2 weeks later by an explosive epidemic of typhoid fever.

(2) There were, in all, 77 proved cases of typhoid fever. The span of the epidemic, with the exception of 2 cases, covered the period July 22 to August 6.

(3) The findings relative to typhoid carriers among food handlers are confusing, and their reliability in some instances is questionable.

(4) The distribution of cases is more or less uniform throughout the circus personnel; all the larger groups, with the exception of trainmen, porters, and elephant men, were affected. The infection rate in the various groups presents no concentration that might be considered significant.

(5) The possibilities (1) that the infection was introduced through infected food or milk, or food which might have become contaminated in the process of preparation and serving, (2) that it was due to ice or to bathing in polluted water, and (3) that it was due to contaminated drinking water, have all been duly considered.

CONCLUSIONS

(1) The nature of the epidemic is such as to establish the hypothesis that infection was shared in common by practically all groups in the circus, that it was received by all simultaneously and at one time only, that it came from without rather than from within the circus, and that it was a heavy dosage of contamination consisting of sewage organisms superimposed on typhoid infection.

(2) The evidence is such as to make it highly improbable, if not impossible, for the epidemic to have been caused by infected food, typhoid carriers, infected ice, or bathing in polluted water.

(3) The characteristics of this epidemic are in all respects typical of and consistent with water-borne infection. The fact that the trainmen and porters, whose drinking-water supply is separate from that of the others of the circus, had no cases of typhoid tends to support this view.

(4) While the conclusion that the epidemic had its origin in polluted drinking water appears to be reasonably certain, the exact place where the infection was picked up cannot be positively determined, though the facts indicate that it was probably somewhere in western Pennsylvania.

ACKNOWLEDGMENTS

The Michigan State Department of Health rendered valuable aid in the study and control of this epidemic. The information contained in the epidemiological table was secured and arranged in large part by that department. A splendid spirit of cooperation was met with on the part of most city health officers where the circus showed. Especially notable in this connection were the city health officers of Detroit Mich., and South Bend, Ind. An essential part of this study is the stool and urine examinations of food handlers. For this service we are specially indebted to the State health offices of Kentucky, Indiana, Wisconsin, Missouri, and Colorado.

Appendix

STANDARD SANITARY REGULATIONS

COOKHOUSE

1. *Water Supply:*
   a. The drinking water shall be secured from the tank designated as drinking-water supply tank.
   b. Water for drinking shall be from the standard covered drinking-water coolers, equipped for spigots for drawing water.
   c. Drinking water shall be served only in clean individual service paper cups.
   d. The use of the common drinking cup or dipper and the practice of dipping drinking water are expressly forbidden.
   e. All ice used in water coolers shall be thoroughly rinsed with clean water after breaking and before being placed in coolers.
   f. All coolers shall be kept clean at all times and thoroughly sterilized once each week in accordance with the instructions of the Superintendent of Sanitation.
2. *Food Handling:*
   a. All food shall be protected against flies, dust, and other sources of contamination to the greatest possible extent at all times, by means of covering and through other practical measures.

b. All cookhouse employees (especially cooks and waiters) shall wear clean outer garments and present evidence of personal cleanliness. All employees handling food shall wash their hands thoroughly with soap and water before entering on duty. All cookhouse employees shall wash their hands thoroughly with soap and water after each visit to the toilet while on duty before returning to duty.

c. Wash basins and individual towels, either paper or cloth, adequate both as to number and distribution, shall be provided at all times for the use of cookhouse employees.

d. All dishes, after being washed, shall be removed from the dishwashing machine, stored, and handled in a manner to prevent soiling or recontamination.

e. Health certificates: Each food handler shall have a certificate from a properly qualified health officer attesting the fact that he is free from venereal disease in a communicable form, is free from evidence of tuberculosis or other communicable disease, and is free from evidence of being a typhoid fever carrier, as indicated by two or more successive stool cultures. The certificate shall also show that he is immune to smallpox and has been inoculated against typhoid fever in the past 3 years. The health certificate shall not be considered valid after 6 months.

3. *Garbage Disposal:* All garbage and refuse must be separated.

a. All paper, trash boxes, and other combustible material shall be collected so as to prevent a nuisance.

b. Table scraps and other organic garbage shall be collected in covered, water-tight, metal garbage cans. Distribution of cans as to number and location shall be adequate to provide for the collection of garbage at all points where garbage accumulates.

c. Except where garbage is collected from the containers by the city or some other agency which will wholly remove same from the grounds, all garbage shall be buried with at least 2 feet of earth, in accordance with instructions of the Superintendent of Sanitation.

4. In addition to the foregoing, all other practicable measures for insuring the safety of food shall be carried out at all times in accordance with the instructions of the Superintendent of Sanitation.

NOTE.—In all towns the "24-hour man" shall use every effort to get a covered garbage wagon to remain at the cookhouse during show day.

FOOD DISPENSED TO THE PUBLIC

1. Sanitary regulations governing the cookhouse shall apply in all respects to all candy butchers and other persons in any way engaged in preparation or dispensing of food to the public, with the following exceptions:

1. When hand dishwashing is done, the dishes shall first be washed in hot water with soap or washing powders, passed through a clean hot water rinse, and again rinsed in a rinse water treated with chlorine to sterilizing strength.

2. Dish towels shall be boiled and rinsed through chlorine sterilizing solution after each use.

3. The cooling water in which all bottled goods are cooled shall at all times be treated with chlorine to sterilising strength.

DISTRIBUTION AND SERVICE OF DRINKING WATER

1. The use of the common drinking cup or dipper and the practice of dipping drinking water are expressly forbidden. Single service paper drinking cups shall be provided in sufficient quantity at all water coolers.

2. All water coolers shall be kept clean, shall be kept covered and shall be sterilized with hypochlorite of lime once each week, in accordance with the instructions of the Superintendent of Sanitation.

3. Circus water tank wagons shall be the only source of water supply used for filling drinking water coolers.

INSTALLATION AND MAINTENANCE OF LATRINES

1. The initial operations of setting up equipment of any department on the circus lot shall include the installation of the latrines and urinal trenches for the department.

2. Chloride of lime shall be applied to latrine trenches and urinal trenches in accordance with the instructions of the Superintendent of Sanitation.

3. The foreman in charge of the department shall be responsible for the sanitary maintenance of latrines serving the department.

FILLING TANKS AND TANK TRUCKS

1. No person connected with the circus, except those responsible for filling the tanks, shall be permitted to take water from any hydrant or other source.

2. The hydrants from which water is taken shall not only be pointed out by a responsible employee of the contracting company, or city, in person, but shall be opened by him or under his direct supervision.

3. Water for all purposes on the circus lot shall be obtained from the circus tanks.

4. All circus water tanks shall be maintained at all times in such condition as not to impair the quality of the water in the tanks or render the same unfit for drinking.

5. The hose used for filling tanks from the hydrants shall be handled at all times in such manner as to prevent the soiling or contamination of surfaces that come in contact with the water discharged into the tank.

6. All circus water tanks shall be sterilized once each week with chloride of lime in accordance with the instructions of the Superintendent of Sanitation.

WATER SUPPLY AND EXCRETA DISPOSAL FOR CARS

1. *Water Supply*: Coolers and tanks on cars shall be filled only from—
   1. The approved drinking water supply source in railroad yards approved by the United States Public Health Service for use on Pullman and railway passenger cars, or
   2. A hydrant on the public water-supply system, which shall not only be pointed out by a responsible employee of the contracting company, or city, in person but shall be opened by him or under his direct supervision.
   3. The hose and other equipment used for filling tanks and coolers shall be handled in a sanitary manner, and the surfaces which come in contact with the water shall be protected against contamination from handling or by soiling with dirt or filth.
   4. All ice used in coolers shall be clean artificial ice. All ice shall be thoroughly rinsed with clean water after it has been broken and before being placed in coolers.

5. All persons engaged in handling or the distribution of drinking water or in handling ice used in coolers shall conform to the requirements of the health certificate and personal cleanliness as prescribed for food handlers.

2. *Excreta Disposal*:
   1. All excreta cans shall be emptied as required as to prevent a nuisance.
   2. Whenever the contents of excreta cans are not removed by a scavenger service in such manner as completely to remove all such material from the vicinity of the cans, the contents of cans shall be buried under a 2-foot covering of earth.
   3. All excreta cans shall be treated regularly with disinfectant solution in accordance with the instructions of the Superintendent of Sanitation.

DEATHS DURING WEEK ENDED MAY 18, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended May 18, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	8,381	8,081
Deaths per 1,000 population, annual basis	11.7	11.3
Deaths under 1 year of age	550	621
Deaths under 1 year of age per 1,000 estimated live births	50	58
Deaths per 1,000 population, annual basis, first 20 weeks of year	12.5	12.4
Data from industrial insurance companies:		
Policies in force	67,773,011	67,789,577
Number of death claims	14,209	13,559
Death claims per 1,000 policies in force, annual rate	11.0	10.4
Death claims per 1,000 policies, first 20 weeks of year, annual rate	10.7	11.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended May 25, 1935, and May 26, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 25, 1935, and May 26, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 25, 1935	Week ended May 26, 1934	Week ended May 25, 1935	Week ended May 26, 1934	Week ended May 25, 1935	Week ended May 26, 1934	Week ended May 25, 1935	Week ended May 26, 1934
New England States:								
Maine	1	7	3	---	172	13	0	0
New Hampshire					12	93	--	0
Vermont					40	28	0	0
Massachusetts	11	7			378	1,116	2	1
Rhode Island	1	2			458		3	0
Connecticut	1	--	2	1	918	173	0	3
Middle Atlantic States:								
New York	29	49	[1] 5	[1] 10	2,901	1,027	12	2
New Jersey	23	12	6	21	2,268	703	3	2
Pennsylvania	36	58			2,577	3,725	9	7
East North Central States:								
Ohio	38	9	5	6	1,241		13	3
Indiana	13	12	7	20	270	1,067	4	2
Illinois	57	32	10	10	1,075	2,291	20	7
Michigan	12	8	3	1	4,110	375	3	3
Wisconsin	1	5	18	13	1,694	2,248	2	1
West North Central States:								
Minnesota	4	5		1	523	174	3	1
Iowa	9	2	5	5	281	302	2	2
Missouri	23	21	30	11	332	540	7	5
North Dakota		6	4		32	131	0	1
South Dakota	2	5			35	214	0	2
Nebraska	4	5			101	185	1	0
Kansas	3	8	1	1	650	547	8	0
South Atlantic States:								
Delaware	1	---			12	136	0	0
Maryland [3]	11	7	0	9	96	1,805	8	0
District of Columbia [3]	12	8		3	66	48	10	0
Virginia [3]	15	7		---	683	1,131	6	1
West Virginia	8	6	35	21	357	157	1	1
North Carolina [3]	10	12	4	10	131	1,332	2	1
South Carolina	1	6	119	117	12	217	0	0
Georgia [4]	10	5	---	----	26	206	0	1
Florida	------	1	1	1	39	206	0	0
East South Central States:								
Kentucky	4	7	9	10	268	632	2	0
Tennessee	5	7	12	9	24	333	7	0
Alabama [4]	8	13	7	18	119	618	1	4
Mississippi [3]	2	12	--------	----	-------	---	1	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 25, 1935, and May 26, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 25, 1935	Week ended May 26, 1934	Week ended May 25, 1935	Week ended May 26, 1934	Week ended May 25, 1935	Week ended May 26, 1934	Week ended May 25, 1935	Week ended May 26, 1934
West South Central States:								
Arkansas	8	5	38	22	83	60	0	0
Louisiana	13	10	5	2	21	157	1	1
Oklahoma [5]	4	5	47	31	65	167	1	3
Texas [4]	31	39	57	85	51	479	0	4
Mountain States:								
Montana [3]	2	3	54	7	569	107	0	0
Idaho			3	3	9	24	0	1
Wyoming [3]					71	68	0	0
Colorado	2	0			339	309	1	2
New Mexico	1	4	7	1	18	71	1	2
Arizona	7		8	5	22	11	2	0
Utah [3]	2		2			16	0	0
Pacific States:								
Washington		4			286		1	1
Oregon [3]		1	21	27	182	39	0	0
California	23	25	32	21	1,612	1,119	11	0
Total	446	446	572	520	20,239	25,122	152	61
First 21 weeks of year	13,475	15,657	100,109	44,686	576,371	558,589	2,095	1,187

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 25, 1935	Week ended May 26, 1934	Week ended May 25, 1935	Week ended May 26, 1934	Week ended May 25, 1935	Week ended May 26, 1934	Week ended May 25, 1935	Week ended May 26, 1934
New England States:								
Maine	0	0	6	10	0	0	2	2
New Hampshire		0	12	8		0		0
Vermont	0	0	2	30	0	0	1	1
Massachusetts	2	2	234	237	0	0	1	0
Rhode Island	0	0	9	20	0	0	0	0
Connecticut	0	0	130	57	0	0	1	1
Middle Atlantic States:								
New York	2	2	1,105	765	0	0	6	13
New Jersey	1	2	177	197	0	0	7	3
Pennsylvania	0	1	564	646	0	0	5	7
East North Central States:								
Ohio	0	3	533	401	0	2	0	11
Indiana	0	1	79	98	1	1	2	5
Illinois	0	2	1,181	421	5	0	5	3
Michigan	0	0	371	635	0	1	7	1
Wisconsin	1	1	548	272	7	24	1	3
West North Central States:								
Minnesota	0	1	279	74	4	7	3	4
Iowa	0	0	70	41	3	1	4	0
Missouri	0	3	48	71	6	0	3	0
North Dakota	0	0	83	27	0	0	3	1
South Dakota	0	0	11		9	5	0	0
Nebraska	0	0	54	21	39	4	0	0
Kansas	0	0	40	33	45	4	2	1
South Atlantic States:								
Delaware	0	0	9	7	0	0	0	2
Maryland [3]	0	0	91	56	0	0	7	9
District of Columbia [3]	0	0	46	12	0	0	1	0
Virginia [3]	0	0	23	23	0	0	7	9
West Virginia	0	0	50	63	0	0	9	6
North Carolina [3]	18	1	16	17	0	0	6	2
South Carolina	0	0	4	1	0	1	17	15
Georgia [4]	3	0		2	1	1	17	26
Florida	0	0	2		0	0	8	3
East South Central States:								
Kentucky	0	0	20	32	0	0	9	4
Tennessee	0	0	9	20	0	0	5	2
Alabama [4]	1	1	8	5	0	0	9	3
Mississippi [3]	0	0	6	6	0	0	4	9

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 25, 1935, and May 26, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 25, 1935	Week ended May 26, 1934	Week ended May 25, 1935	Week ended May 26, 1934	Week ended May 25, 1935	Week ended May 26, 1934	Week ended May 25, 1935	Week ended May 26, 1934
West South Central States:								
Arkansas	0	0	7	[illegible]	0	2	7	2
Louisiana	[illegible]	0	[illegible]	8	0	0	10	12
Oklahoma [5]	1	1		[illegible]	2	4	0	5
Texas [4]	0	0	[illegible]	42	8	[illegible]	9	13
Mountain States:								
Montana [3]	0	0	9	[illegible]	[illegible]	4	0	2
Idaho	0	1	1	1	0	0	0	0
Wyoming [3]	0	0	0	1	2	5	0	0
Colorado	0	0	[illegible]	[illegible]	3	4	1	3
New Mexico	0	0	11	11	0	0	1	[illegible]
Arizona	1	2	31	13	0	0	3	10
Utah [2]	0	0	104	2	0	0	0	0
Pacific States:								
Washington	0	0	55	73	39	0	1	1
Oregon	0	2	[illegible]	32	1	2	2	3
California	[illegible]	[illegible]	[illegible]	174	16	2	5	16
Total	8	118	[illegible]	[illegible]	203	100	170	232
First 21 weeks of year	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2,911	3,408

1 New York City only.
2 Week ended earlier than Saturday.
3 Rocky Mountain spotted fever, week ended May 25, 1935, [illegible] cases, as follows: District of Columbia, 1; Virginia, 1; North Carolina, 1; Montana, 7; Wyoming, 10; Oregon, 4.
4 Typhus fever, week ended May 25, 1935, [illegible] cases, as follows: Georgia, 9; Alabama, 5; Texas, 1.
5 Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
February 1935										
North Dakota		31	155		364		0	256	5	1
March 1935										
North Dakota	4	23	[illegible]		437		0	409	8	1
April 1935										
Alabama	14	43	[illegible]	261	1,483	52	2	30	15	16
Arizona	5	7	101	1	210	1	1	227	9	5
District of Columbia	26	80	8		291		1	368	0	1
Kansas	6	41	[illegible]		5,437		4	910	90	8
Louisiana	2	84	114	60	380	9	5	32	4	78
Montana	4	42	104		2,116		0	28	30	2
North Dakota		8	29		102		0	228	3	1
Pennsylvania	27				21,915	1	2	3,002	0	30
Virginia	30	[illegible]	300	8	[illegible]	5	0	[illegible]	2	15
Wisconsin	11	11	126		6,804		2	1,090	74	6

February 1935

	Cases
North Dakota:	
Chicken pox	118
Mumps	6
Vincent's infection	2
Whooping cough	48

March 1935

	Cases
North Dakota:	
Chicken pox	106
Mumps	14
Septic sore throat	1
Vincent's infection	1
Whooping cough	19

April 1935

	Cases
Anthrax:	
Pennsylvania	1
Botulism:	
Montana	4
Chicken pox:	
Alabama	197
Arizona	57
District of Columbia	251
Kansas	367
Louisiana	38
Montana	169
North Dakota	86
Pennsylvania	3,788
Virginia	377
Wisconsin	1,417
Dysentery:	
Arizona	5
Louisiana (amoebic)	7
Louisiana (bacillary)	3
Virginia (amoebic)	1
Virginia (diarrhea included)	50
Epidemic encephalitis:	
Alabama	1
District of Columbia	2
Kansas	18
Montana	1
Pennsylvania	7
Wisconsin	3
Food poisoning:	
Montana	1

April 1935—Continued

	Cases
German measles:	
Alabama	32
Arizona	190
Kansas	3,589
Montana	1,291
Pennsylvania	5,932
Wisconsin	10,547
Hookworm disease:	
Louisiana	31
Impetigo contagiosa:	
Kansas	2
Montana	1
Leprosy:	
Louisiana	1
Mumps:	
Alabama	122
Arizona	134
Kansas	622
Louisiana	9
Montana	265
North Dakota	41
Pennsylvania	4,431
Virginia	290
Wisconsin	1,782
Ophthalmia neonatorum:	
Alabama	2
Pennsylvania	9
Virginia	1
Paratyphoid fever:	
Kansas	1
Louisiana	2
Virginia	2
Puerperal septicemia:	
Montana	1
Rabies in animals:	
Alabama	99
Kansas	8
Louisiana	31
Rabies in man:	
Alabama	1
Rocky Mountain spotted fever:	
Montana	11
Scabies:	
Kansas	10
Montana	5

April 1935—Continued

	Cases
Septic sore throat:	
Kansas	9
Louisiana	2
Montana	17
Virginia	3
Wisconsin	8
Tetanus:	
Alabama	7
Kansas	1
Virginia	2
Trachoma:	
Arizona	36
Montana	4
Pennsylvania	1
Trichinosis:	
Pennsylvania	1
Tularaemia:	
Alabama	5
Kansas	2
Louisiana	7
Montana	1
Pennsylvania	1
Virginia	3
Typhus fever:	
Alabama	3
Louisiana	2
Undulant fever:	
Alabama	3
Kansas	1
Louisiana	5
Montana	1
Pennsylvania	4
Virginia	1
Wisconsin	3
Vincent's infection:	
Kansas	3
Montana	1
North Dakota	4
Whooping cough:	
Alabama	210
Arizona	82
District of Columbia	19
Kansas	318
Louisiana	18
Montana	171
North Dakota	24
Pennsylvania	1,397
Virginia	289
Wisconsin	511

PLAGUE-INFECTED GROUND SQUIRREL IN MODOC COUNTY, CALIF.

The Director of Public Health of California reports that a ground squirrel from a ranch 15 miles west and 4 miles south of Alturas, Modoc County, Calif., has been proved positive for plague. The squirrel was received at the laboratory May 15, 1935.

WEEKLY REPORTS FROM CITIES

City reports for week ended May 18, 1935

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0	1	0	2	1	1	0	1	0	7	29
New Hampshire											
Concord	0		0	0	0	0	0	1	0	0	9
Manchester	0		0	0	1	1	0	0	0	0	8
Nashua	0			0		1	0		0	0	----
Vermont											
Barre	0		0	9	0	0	0	0	0	0	3
Burlington	0		0	8	0	0	0	0	1	0	6
Massachusetts											
Boston	3		1	73	31	50	0	9	0	26	225
Fall River	0		0	1	3	9	0	1	0	2	31
Springfield	0		0	96	4	25	0	0	0	3	29
Worcester	0		0	5	10	0	0	2	6	4	58
Rhode Island											
Pawtucket	0		0	0	0	0	0	0	0	0	19
Providence	2		1	114	5	15	0	1	0	6	50
Connecticut											
Bridgeport	0		0	6	0	6	0	1	1	2	28
Hartford	0		0	15	1	18	0	10	0	12	
New Haven	0		0	201	1	1	0	0	0	0	48
New York											
Buffalo	1		0	17	14	72	0	12	0	31	124
New York	27	8	0	1,190	121	581	0	105	4	104	1,581
Rochester	0		0	131	9	25	0	3	0	32	83
Syracuse	0		0	408	2	24	0	0	0	31	46
New Jersey											
Camden	3		0	2	0	5	0	1	0	6	19
Newark	0	5	0	548	11	13	0	13	0	68	89
Trenton	1		0	4	4	4	0	5	0	0	33
Pennsylvania											
Philadelphia	10	6	2	107	31	94	0	21	1	81	479
Pittsburgh	2	4	3	325	17	38	0	8	0	19	156
Reading	0		1	119	2	6	0	0	0	4	30
Scranton	0		--	6		1	0		0	4	
Ohio											
Cincinnati	5		0	11	11	13	0	5	0	3	143
Cleveland	6	20	2	440	18	58	0	10	1	19	201
Columbus	1		0	121	7	15	0	4	0	1	87
Toledo	0	1	0	103	8	14	0	6	0	5	77
Indiana											
Fort Wayne	6		0	6	0	0	0	0	0	1	22
Indianapolis	4		0	90	16	15	0	0	0	35	114
South Bend	0		0	1	5	4	0	1	0	0	15
Terre Haute	1		1	3	0	0	0	0	0	5	20
Illinois											
Chicago	10	8	3	928	50	[illegible]	0	48	3	72	[illegible]
Springfield	1		0	10	2	7	0	0	0	3	12
Michigan											
Detroit	5	3	0	1,407	31	152	0	16	1	131	[illegible]
Flint	0		0	4	4	15	0	1	0	5	20
Grand Rapids	0		0	0	4	24	0	0	0	17	[illegible]
Wisconsin											
Kenosha	0		0	15	2	10	0	0	0	8	4
Milwaukee	0		1	267	5	90	0	4	0	32	[illegible]
Racine	0		0	116	0	29	0	0	0	10	14
Superior	0		0	5	1	0	0	0	0	0	13
Minnesota											
Duluth	0		0	105	1	6	0	0	0	0	12
Minneapolis	4		0	87	3	112	0	1	0	24	78
St. Paul											
Iowa:											
Davenport	0			0		1	0		0	0	
Des Moines	2		0	164	0	2	0	0	0	5	[illegible]
Sioux City	1					0	0		0	2	
Waterloo	1			4		6	0		0	0	
Missouri:											
Kansas City	2		0	48	6	8	0	3	0	3	[illegible]
St. Joseph	0		0	15	3	4	0	0	0	1	[illegible]
St. Louis	12		0	[illegible]	10	7	0	11	0	15	[illegible]

City reports for week ended May 18, 1935—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
North Dakota:											
Fargo	1	...	0	1	2	11	0	0	0	2	10
Grand Forks	0	...	...	0	...	1	1		0	0	
South Dakota:											
Aberdeen	0	...	...	11	...	0	0		0	3	...
Nebraska:											
Omaha	3	...	0	50	8	10	1	0	0	0	55
Kansas:											
Topeka	...	...	...	...	...	...	...	...	...	...	...
Wichita	0	...	0	78	5	2	0	1	1	1	22
Delaware:											
Wilmington	2	...	0	6	3	7	0	0	0	2	22
Maryland:											
Baltimore	4	1	1	35	25	50	0	14	1	51	214
Cumberland	0	2	1	1	1	0	0	0	0	0	13
Frederick	0	...	0	13	0	0	0	0	0	3	2
Dist. of Columbia:											
Washington	10	...	0	40	16	43	0	10	0	1	170
Virginia:											
Lynchburg	0	...	0	5	0	0	0	0	0	12	5
Norfolk	0	...	0	4	3	0	0	2	0	4	35
Richmond	0		0	35	5	0	0	5	0	0	58
Roanoke	1	...	0	17	3	1	0	1	0	0	16
West Virginia:											
Charleston	1	1	1	6	1	0	0	0	0	1	23
Huntington	0			10	...	3	0		0	0	...
Wheeling	0		0	58	5	1	0	1	1	0	21
North Carolina:											
Raleigh	0	...	0	5	1	0	0	0	0	4	8
Wilmington	0	...	0	0	1	0	0	0	0	1	15
Winston-Salem	0		0	5	0	0	0	0	0	0	14
South Carolina:											
Charleston	0	1	0	1	6	0	0	2	0	1	20
Columbia	0	...	0	0	1	0	0	0	0	0	12
Georgia:											
Atlanta	3	2	1	3	9	2	0	5	0	14	76
Brunswick	0	...	0	0	1	0	0	0	0	2	3
Savannah	1	1	1	1	1	0	0	1	1	4	31
Florida:											
Miami	0	1	1	1	1	1	0	4	2	1	20
Tampa	0	...	0	11	0	0	0	1	0	1	35
Kentucky:											
Ashland	1	...	...	12	...	0	0	...	0	0	...
Lexington	1	...	0	12	5	1	0	2	0	5	22
Louisville	4	1	0	160	5	7	0	2	0	10	91
Tennessee:											
Memphis	1	...	1	2	8	2	0	0	1	4	90
Nashville	0	...	0	1	2	3	0	3	1	0	32
Alabama:											
Birmingham	2	1	0	30	3	1	0	5	0	2	71
Mobile	0	...	2	4	0	0	0	0	0	0	10
Montgomery	0	...	...	0	...	2	1		0	0	...
Arkansas:											
Fort Smith	0	...	...	0	...	0	0	...	0	0	...
Little Rock	0	...	0	8	4	1	0	2	0	8	21
Louisiana:											
New Orleans	8	4	2	30	10	2	0	14	1	0	150
Shreveport	0	...	0	3	5	0	0	3	0	0	32
Oklahoma:											
Oklahoma City	1	6	0	7	5	1	0	0	0	3	41
Texas:											
Dallas	2	2	2	1	9	1	1	6	0	1	53
Fort Worth	2	...	0	0	4	3	0	2	0	0	30
Galveston	0	...	0	2	4	1	0	1	0	0	23
Houston	10	...	0	0	4	1	0	7	2	0	83
San Antonio	0	...	0	0	9	0	0	10	0	0	70
Montana:											
Great Falls	0	...	0	3	2	0	0	0	0	8	7
Helena	0	...	0	2	0	0	0	0	0	22	5
Missoula	0	...	0	5	1	0	0	0	0	0	3
Idaho:											
Boise	0	...	0	0	0	0	0	2	0	0	5
Colorado:											
Denver	5	...	1	107	1	93	0	5	0	0	63
Pueblo	0	...	0	46	0	3	0	0	0	4	7
New Mexico:											
Albuquerque	0	...	0	7	1	0	0	2	0	13	10

City reports for week ended May 18, 1935—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Utah:											
Salt Lake City	1		0	1	[illegible]	115	0	0	0	93	21
Nevada:											
Reno	0			1		0	0		1	0	...
Washington:											
Seattle	0		0	200	2	23	[illegible]	1	0	11	74
Spokane	0		0	5	2	4	0	0	0	2	32
Tacoma	0		0	[illegible]	[illegible]	1	1	0	0	1	33
Oregon:											
Portland	0	1	1	93	1	[illegible]	0	1	0	0	76
Salem	0	1		2		0	0		0	0	--
California:											
Los Angeles	9	10	1	56	13	35	5	2	4	11	340
Sacramento	0	1	1	20	[illegible]	7	1	3	0	1	13
San Francisco	1	2	0	1	3	19	0	11	0	23	168

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases	State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Rhode Island:				District of Columbia:			
Providence	1	1	0	Washington	8	0	0
New York:				Virginia:			
New York	31	6	4	Norfolk	4	2	0
Pennsylvania:				North Carolina:			
Philadelphia	2	1	0	Raleigh	0	0	1
Pittsburgh	2	1	0	Winston-Salem	1	1	0
Ohio:				Kentucky:			
Cincinnati	7	5	0	Louisville	2	1	0
Cleveland	2	2	0	Tennessee:			
Toledo	0	1	0	Memphis	2	0	0
Illinois:				Arkansas:			
Chicago	10	5	0	Fort Smith	1	0	0
Iowa:				Little Rock	0	2	0
Davenport	1	0	0	Louisiana:			
Sioux City	1	0	0	New Orleans	0	0	1
Missouri:				Oklahoma:			
Kansas City	2	0	0	Oklahoma City	2	0	0
St. Joseph	0	1	0	Washington:			
St. Louis	11	3	0	Seattle	1	0	0
Nebraska:				Spokane	1	0	0
Omaha	1	0	0	Oregon:			
Maryland:				Portland	1	0	0
Baltimore	7	2	0	California:			
Cumberland	1	0	0	Los Angeles	0	0	5

Dengue.—Miami, 1 case.

Epidemic encephalitis.—Cases: Trenton, 1; Columbus, 1; Washington, 1; Miami, 1; Seattle, 3.

Pellagra.—Cases: Scranton, 1; Winston-Salem, 1; Charleston, S. C., 4; Savannah, 1; Miami, 2; Birmingham, 1; New Orleans, 1.

Typhus fever.—Cases: New York, 2; Springfield, Ill., 1; Charleston, S. C., 1; Savannah, 1; Montgomery, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended May 4, 1935.—During the 2 weeks ended May 4, 1935, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis		2		1	1					4
Chicken pox		2		311	324	66	32	15	98	879
Diphtheria		3		20	6	8	11			48
Dysentery				6						6
Erysipelas				11	2	6	3	1	1	27
Influenza		70	2	9	10	6			60	157
Lethargic encephalitis						1				1
Measles		186	10	1,410	5,840	227	137	71	183	8,123
Mumps		16	1		573	134	5	31	60	810
Pneumonia		17			31				21	69
Poliomyelitis				2						2
Scarlet fever		15	7	215	275	29	26	12	59	638
Trachoma						2	3		7	12
Tuberculosis	3	1	18	134	98	30	28	5	32	349
Typhoid fever				30	8	1				39
Undulant fever				1	2	3			1	7
Whooping cough		2	1	78	302	82	102	18	151	716

CZECHOSLOVAKIA

Communicable diseases—March 1935.—During the month of March 1935, certain communicable diseases were reported in Czechoslovakia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	5		Paratyphoid fever	3	
Cerebrospinal meningitis	22	6	Poliomyelitis	7	2
Chicken pox	281		Puerperal fever	45	20
Diphtheria	2,230	172	Scarlet fever	1,704	25
Dysentery	31	5	Trachoma	84	
Influenza	112,707	109	Typhoid fever	220	29
Lethargic encephalitis	3	2	Typhus fever	52	1
Malaria	13				

JAMAICA

Communicable diseases—4 weeks ended May 18, 1935.—During the 4 weeks ended May 18, 1935, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis		1	Leprosy	1	2
Chicken pox	[illegible]	18	Poliomyelitis	1	
Diphtheria		1	Puerperal fever	5	15
Dysentery	4	6	Tuberculosis	18	96
Erysipelas		1	Typhoid fever	9	52

PUERTO RICO

Notifiable diseases—4 weeks ended May 18, 1935.—During the 4 weeks ended May 18, 1935, cases of certain notifiable diseases were reported in the municipalities of Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chicken pox	167	Ophthalmia neonatorum	2
Diphtheria	12	Paratyphoid fever	1
Dysentery	16	Scarlet fever	1
Erysipelas	2	Syphilis	31
Filariasis	1	Tetanus	1
Influenza	10	Tetanus, infantile	1
Malaria	[illegible]	Tuberculosis	651
Measles	172	Typhoid fever	17
Mumps	111	Whooping cough	207

YUGOSLAVIA

Communicable diseases—April 1935.—During the month of April 1935, certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	17	4	Paratyphoid fever	2	
Cerebrospinal meningitis	15	8	Scarlet fever	[illegible]	4
Diphtheria and croup	404	40	Sepsis	7	3
Dysentery	16		Tetanus	29	16
Erysipelas	157	[illegible]	Typhoid fever	132	21
Influenza	17,973	98	Typhus fever	101	10
Measles	919	10			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for May 31, 1935, pp. 719-764. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued June 28, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

China—Canton.—During the week ended May 18, 1935, 1 case of cholera was reported at Canton, China.

Plague

Indo-China—Pnom-Penh.—During the week ended May 18, 1935, 1 case of plague was reported at Pnom-Penh, Indo-China.

Peru.—Plague has been reported in Peru as follows: In the city of Lima, 2 cases with 1 death were reported during the month of March 1935 and 9 cases with 7 deaths were reported during the month of April 1935. Thirteen cases of plague with 10 deaths were also reported for the whole country of Peru during April 1935.

Senegal—Louga Circle. During the period May 1–10, 1935, 1 case of plague was reported in Louga Circle, Senegal.

United States—California. A report of plague-infected ground squirrels in California appears on page 804 of this issue of PUBLIC HEALTH REPORTS.

Yellow fever

Togo—Sokode.—On May 19, 1935, 1 death from yellow fever was reported at Sokode, Togo.

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UNITED STATES TREASURY DEPARTMENT

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

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Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

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PUBLIC HEALTH REPORTS

VOL. 50 JUNE 14, 1935 NO. 24

THE IRRITANTS IN ADHESIVE PLASTER

By LOUIS SCHWARTZ, *Senior Surgeon, United States Public Health Service*, and SAMUEL M. PECK, *Assistant Clinical Professor of Dermatology and Syphilology, New York University*

Skin reactions following the use of adhesive plaster are of frequent occurrence. Often this manifestation of the skin is not only the cause of great discomfort to the patient but actually interferes with the plan of treatment.

In making patch tests, reactions from adhesive plaster often occur and are not only annoying to the patient but may interfere with the reading of the reaction. Shelmire (*1*), in a recent article, summed up the obstacles that irritation from adhesive plaster presents in the field of patch testing and advocated a substitute for the adhesive plaster. This study was undertaken with the purpose of determining, if possible, the irritating substances in adhesive plaster so that an intelligent effort could be made by manufacturers to eliminate them or provide harmless substitutes.

A number of observers have been interested in the causes of dermatitis produced by adhesive plaster. Bloch reports that 1 percent of the normal population develops dermatitis from adhesive tape. Siemens (*2*) tested susceptible cases with the ingredients of adhesive plaster and came to the conclusion that dammar resin was responsible for some of the irritating qualities. He believed that the reaction was not based on idiosyncrasy but was really due to direct irritation. Kilmer (*3*) stated that, as the result of his investigations, the ingredients of adhesive tape are not irritating as such. He believes that the skin secretions are retained under the moisture-repellent coating, with a resultant maceration of the epidermis. He states that this, rather than idiosyncrasy, is the most frequent cause of the irritation. He also states, however, that there might be a few instances of reactions due to adhesive plaster which are based on specific hypersensitivity.

In our own observations the skin manifestations following applications of adhesive tape can be roughly divided into two types: In one we have erythema and, in some cases, even edema and vesicles which are due to direct traumatic irritation as the result of the application of a firmly adherent substance to the skin with resultant trauma on its removal. This reaction is usually fleeting in character or, at the most, subsides after 2 or three days.

The other type of reaction due to adhesive is caused by hypersensitivity to one or more of the ingredients of the plaster and is a dermatitis venenata, or a contact eczema. This type of reaction usually increases in severity after the removal of the plaster and lasts for a considerable period of time. In many cases the severity of the reaction increases with the continued use of the adhesive plaster.

METHODS OF MANUFACTURE OF ADHESIVE PLASTER

The methods for the manufacture of adhesive plaster are more or less secret. No textbooks could be found describing the process. A number of firms manufacturing adhesive plaster in the United States were informed as to the purpose of this study and were asked to describe their method of manufacture and to give us a list of the ingredients which they used. A number of them listed and sent samples of the ingredients used, and one manufacturer permitted us to inspect his method of manufacture and to do the patch tests required on volunteer workmen from the factory. The ingredients used are listed below. All of these were not used by any one manufacturer.

1. Rubber:
   - *a.* South American Para rubber.
   - *b.* Plantation smoked sheet.
   - *c.* Balata rubber.
   - *d.* Gutta siac.
2. Rosin, grade I.
3. "Burgundy" pitch.
4. Olibanum.
5. Beeswax.
6. Zinc oxide.
7. Anhydrous lanolin.
8. Starch.
9. Orris root.

A homogeneous mass is made by milling rubber, gutta siac, or balata, with adhesives such as rosin, pitch, and olibanum, fillers such as orris root, starch, and zinc oxide. Beeswax and lanolin are also added for other purposes. This homogeneous mass is spread by calender machines on suitable fabrics.

PATCH TESTS

For the purpose of this study 120 employees of a plant manufacturing adhesive tape were used in the experiment. Eight varieties of adhesive plaster manufactured by 6 different companies were obtained and placed as patches about 1 inch square on the arms and backs of these test subjects. They were left on for 48 hours, at the end of which time 50 of the patients showed a reaction to one or more of the adhesives applied.

There was no marked difference in reaction to any particular adhesive. The least number of reactions obtained from any adhesive was 16 percent, and the greatest number from any one adhesive was 25 percent.

The sites of the patches were again inspected 2 days after the removal of the adhesive. At that time 13 of the 70 patients in whom no reaction had been observed at the end of the 48-hour period showed late reactions. Some of the reactions seen upon the removal of the plaster had become intensified. It was interesting to observe that, in a number of instances where only a few of the adhesives seemed to give a reaction there was a delayed reaction to all of the previously inactive adhesives.

The reactions observed varied from a slight erythema to an erythema with edema, papules, and vesicle formation.

For the purposes of this study, the patients were divided into three classes:

Class A.—In this group were placed those who showed marked reactions at the first removal of the adhesive tape with continued intensification at the second inspection.

Class B.—In this group were placed those who showed a negative or only a slight erythema at the first inspection but who later developed delayed reactions.

Class C. Patients who at no time showed anything more than varying degrees of erythema at the site of the adhesive patch.

Twenty-one of the 63 patients who had showed reactions volunteered for further patch testing with the ingredients of the adhesive plasters. Six of these were in Class A, 12 in Class B, and 3 in Class C.

It was not possible to test all of these cases, especially the women, with more than 5 of the 11 ingredients which we wished to study. However, in each instance where only a limited number of tests could be made, those substances were tried which we thought were responsible for the irritation. One of the 10 men tested had 12 patches placed on his back, because he stated that he was sensitive to raw South American Para rubber biscuits, and a piece of this material was used on him as a patch test.

SUBSTANCES USED IN PATCH TESTS

1. South American Para rubber, which had been milled, washed, and dried, ready to be incorporated into the adhesive mass.
2. Starch.
3. Lanolin.
4. Orris root.
5. I-Rosin.
6. Olibanum.
7. Gutta siac.
8. Beeswax.
9. Burgundy pitch.
10. Zinc oxide.
11. Wood rosin extracted from stumps of pine trees.

The patches were left on for 48 hours and the reactions read. They were inspected for late reactions 72 hours after the patches had been removed.

DESCRIPTION OF INGREDIENTS USED AS PATCH TESTS

The rosins used in the manufacture of adhesive plaster belong to the class of natural resins. These rosins are divided, according to T. Hedley Barry (*4*) into eight classes, with relation to their hardness, no. 1 being the softest:

1. Dammar resin;
2. Shellac;
3. Mastic;
4. Sandarac;
5. Rosin;
6. Elemi;
7. Turpentine oleo resin;
8. Burgundy pitch.

Rosin is obtained from trees of the order of Coniferae, genus *Pinus*. All pines may be used, but most of the rosin in the United States is collected from the long leaf and the short leaf pines. The trees are scarred, and the exuding gum is collected, and purified by filtration, sedimentation, and distillation, removing the turpentine which is the principal product. The residue, called colophony, is the source of the different grades of rosin. The rosin collected the first year that the tree is tapped is light in color and is graded by the manufacturers according to color from WW to K. The second season that the tree is tapped, the rosin obtained is darker and more viscous and is graded by the manufacturer from I to G. With successive tappings, the sap obtained contains less turpentine and less rosin.

Rosins contain a number of oils and acids. The principal ones are kidney oil, bloom oil, abietic acid (alpha, beta, and gamma), pinnic acid (alpha, beta, and gamma), sylvic acid, and abietic anhydride.

Wood rosin is a name applied to rosin extracted by a special process from the stumps of pine trees. It is very similar to ordinary rosin.

Olibanum is a gum resin obtained from the exuded juice of a tree belonging to the genus *Boswellia*, which grows in East Africa and the southern coast of Arabia. It is pale yellow, has a pleasant aromatic odor, and is used only in certain varieties of plaster so as to give them a pleasant odor.

South American Para rubber, which comes to the United States in so-called "biscuits", is obtained by tapping the rubber tree and is cured over a small fire made of the fruits or nuts of the urucuri. This fire gives a dense smoke rich in the products of distillation, such as creosote, tarry matter, and acetic acid. A long wooden rod, or mandrel, with a paddle attached, is covered with a thin film of the latex collected from the tree. This is rotated in the smoke until the latex sets, when a fresh layer of latex is poured over the first and the process repeated until a biscuit of smoked Para rubber, weighing from 20 to 100 pounds, is built up. Such a biscuit of rubber, by the very nature of the curing method, is saturated and impregnated with creosote, tarry matter, and acetic acid.

Plantation rubber is obtained from the Malay Peninsulas, the East Indies, and Sumatra. The latex is collected and is coagulated by the addition of dilute acetic acid. After the coagulum is formed, it is removed from the serum and passed through washing roller mills, which squeeze out the mother liquor and wash out extraneous materials. The sheets are then hung up to dry and are frequently smoked during the drying period by burning coconut husks and hard wood. The products of this smoking are only on the surface of the crepe formed sheet and are not impregnated into the rubber itself, as is the case with the South American Para rubber. Plantation rubber is dry and clean, while the South American Para rubber contains moisture, sand, stones, bark, and other impurities which must be cleaned out before it is used. While plantation rubber contains about 6 percent of impurities, South American Para may contain anywhere from 12 to 40 percent.

Studies made in tire-manufacturing plants, where crepe and smoked sheet rubber are exclusively used, fail to show any dermatitis among those handling the raw rubber, whereas in the course of the present studies we found one worker who develops a severe dermatitis every time he handles South American Para rubber biscuits.

Balata is the product obtained by coagulating the latex of *Mimusops globosa*, a large forest tree belonging to the order of Sapotaceae, a native of British, Dutch, and French Guiana, and Trinidad, Jamaica, and Brazil. It resembles true gutta percha in physical properties, and the tree yielding it belongs to the same order which furnishes gutta percha (*Palaquium* spp.). Balata, like gutta percha, consists of a hydrocarbon $C_{10}H_{16}$, associated with resins, but contains a

higher percentage of resins than gutta percha. The resins in balata are similar to those in gutta percha and consist of—

(1) Albane, which is soluble in hot alcohol.

(2) Fluavile, which is soluble in cold alcohol.

Gutta siac is very similar in its properties to balata and gutta percha.

The so-called "Burgundy" pitch used in adhesive plaster manufacture does not necessarily come from Burgundy. That which we tested was a mixture of resins and other substances, the composition of which is kept secret by the makers.

Beeswax, zinc oxide, lanolin, starch, and orris root need no description.

RESULTS OF TESTS

Class A.—The 6 persons patched in this class were males and were patched with all of the 11 substances listed above. (Altogether there were 7 cases in this group, 1 of them a woman who would not submit to more than the original tests with the 8 varieties of adhesive.) We thought that the reactions in this group were due to hypersensitivity. In all of these cases we had erythema, edema, papules, and vesicles which did not disappear but went on to eczematization. As can be seen from table 1, there was not a single instance in which there was sensitization to less than two of the ingredients used as patches. All six were sensitive to "Burgundy" pitch. Three showed marked positive reactions and two showed questionable reactions to South American Para rubber that had been milled, washed, and dried. Three showed positive patch tests to wood rosin obtained from pine-tree stumps. Two gave positive reactions to olibanum, two to beeswax, and one each to lanolin, orris root, I-rosin, and gutta siac.

Class B.—Altogether there were 34 cases put in this class. Of this number, 12 consented to further patch testing 11 women and 1 man. The man was patched with all 11 of the ingredients and the women with only 5 of them, namely, (1) South American Para rubber, which had been milled, washed, and dried; (2) I-rosin; (3) "Burgundy" pitch; (4) zinc oxide; and (5) wood rosin.

In this class we thought that we were dealing with reactions of hypersensitivity of the delayed type, because the delayed reactions in these cases were more pronounced than were the reactions seen immediately upon removal of the patches. These delayed reactions also showed erythema, edema, papules, and vesicles which persisted for a number of days. These may be the types of cases which become more and more sensitive to adhesive tape, depending on the duration of the application and the number of times within a given period that the adhesive is applied.

TABLE 1.—*Summary of reactions*

Class and subject	Substances for patching										
	S. A. Para rubber	Starch	Anhydrous lanolin	Orris root	I-Rosin	Olibanum	Gutta siac	Beeswax	"Burgundy" pitch	Zinc oxide	"Wood" rosin
Class A											
J. B. C. (M)	?	−	−	−	−	−	−	−	+	−	+
E. J. D. (M)	−	−	−	−	−	−	?	+	+	−	+
W. F. (M)	+	?	+	?	−	+	−	−	+	?	−
D. D. (M)	+	−	−	−	−	−	+	−	+	−	−
J. F. B. (M)	?	−	−	−	+	+	−	+	+	−	−
M. A. (M)	+	-----	?	+	?	-----	-----	?	+	-----	+
Class B											
H. A. (M)	−	−	−	−	+	−	−	−	−	−	−
G. K. (F)	−	0	0	0	+	0	0	0	−	−	−
C. D. (F)	+	0	0	0	+	0	0	0	+	−	+
G. V. S. (F)	?	0	0	0	−	0	0	0	−	−	+
M. C. (F)	?	0	0	0	+	0	0	0	−	−	+
L. O. H. (F)	+	0	0	0	−	0	0	0	−	−	+
H. K. (F)	?	0	0	0	+	0	0	0	+	−	+
C. H. (F)	−	0	0	0	−	0	0	0	−	−	?
M. F. (F)	−	0	0	0	−	0	0	0	−	−	−
E. W. (F)	−	0	0	0	−	0	0	0	−	−	−
G. O. L. (F)	?	0	0	0	−	0	0	0	?	−	−
M. E. L.[1] (F)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Class C											
O. L. V. (M)	−	−	−	?	−	−	−	−	−	−	?
G. R. (M)	−	−	−	−	−	−	−	?	−	−	−
F. B. (M)	−	−	−	−	−	−	−	−	−	?	−
Total	5	-----	1	1	6	2	1	2	8	-----	8
Percent	25	-----	5	5	30	10	5	10	40	-----	40

[1] Reaction too general to be read for individual patches.

+ Positive reaction. ? Faint erythema; doubtful reaction.

− No reaction. 0 Not patched.

One of the women tested showed such a generalized reaction that it was impossible to differentiate between the individual patches. Six of the women showed positive reactions to one or more of the patches. Two of them showed questionable reactions to one of the patches, and 2 showed no reactions to any of the patches. The fact that no reactions, or only questionable ones, resulted in four of these women, may be interpreted either as a possible sensitization to one of the ingredients of adhesive plaster with which they were not patched or to the fact that their reactions in the first series of tests were due to the summation of effects from several of the ingredients in adhesive plaster. In this group, when the patches were first removed there were 2 reactions to rubber, 4 to I-rosin, 2 to "Burgundy" pitch, and 2 to wood rosin. The sites were again inspected 72 hours after the removal of the patches. At this time the original reactions were still present and eczematoid in character. In addition there were 3 subjects who showed a questionable reaction to rubber, 1 individual who showed a positive reaction to I-rosin, and 3 more

showed reactions to wood rosin. These, of course, were delayed reactions.

Class C.—We were able to obtain only three men in this group for further patching. They were patched with all of the 11 ingredients listed, and in no instance could we obtain a real positive reaction. One gave a questionable reaction to orris root, 1 a questionable reaction to beeswax, and 1 a questionable reaction to zinc oxide. We believe that the original reactions in this group to the eight patches of adhesive were due purely to mechanical irritation of the plaster and maceration of the skin. None of these reactions lasted so that they could be seen 72 hours after the patches had been removed.

SUMMARY

Twenty-one subjects showing various degrees of adhesive plaster reaction were tested with 11 ingredients of adhesive plaster. One of these developed a generalized reaction so that individual tests could not be evaluated. Seven of the remaining 20 were negative to the patch tests. Of the 13 remaining, 8 showed positive reactions to wood rosin extracted from the stumps of pine trees; 8 to so-called "Burgundy" pitch; 6 to I-rosin; 5 to South American para rubber, which had been milled, washed, and dried; 2 to beeswax; 2 to olibanum; and 1 each to lanolin, orris root, and gutta siac.

All of the subjects in class A showed positive reactions to 1 or more of the rosins, and 50 percent were sensitive to rubber.

Seven of the subjects tested in class B were sensitive to 1 or more of the rosins, and 2 were sensitive to rubber.

The tests seemed to indicate that there are two types of reactions to adhesive tape: One is purely chemical and due to resultant maceration and mechanical trauma from the application and the removal of the plaster, and the other is due to hypersensitivity to one or more of the ingredients of the plaster. The results indicate that the chief irritants in the adhesive plasters that we tested are the rosins, in which can be included the so-called "Burgundy" pitch, and the smoke-cured wild rubber, of which South American Para is an example.

An attempt was made to determine whether complexion or previous diseases of the skin or an allergic diathesis had a predisposing effect on sensitivity to adhesive plaster. All the subjects patched with adhesive plaster were questioned as to these facts. No such correlation could be established.

CONCLUSIONS

1. Skin reactions following the use of adhesive plaster are of frequent occurrence.

2. There are two kinds: (*a*) Due to traumatic phenomena and maceration resulting from the application and removal of a firmly

adherent material; and (*b*) an eczematoid reaction due to hypersensitivity to one or more of the ingredients of the plaster.

3. The reaction classed under 2 (*a*) disappears shortly after the removal of the plaster.

4. The reaction classed under 2 (*b*) persists for many days.

5. The chief irritants in adhesive plaster have been found to be the resins and the smoke-cured wild rubber.

6. It is obvious that the irritation due to the tackiness of the adhesive cannot be avoided. It seems, however, that research in adhesive manufacture should make it possible to substitute nonirritating types of resins and rubber for the present types used.

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COURT DECISION ON PUBLIC HEALTH

Power of city to prohibit and regulate privies not limited by contract between it and individual regarding cleaning of privies. (Arkansas Supreme Court; *Bowers* v. *City of North Little Rock*, 77 S. W.(2d) 797; decided January 14, 1935.) The plaintiff, under the terms of a contract with the defendant city, was given the right to clean unsewered privies in the city. For such cleaning he was entitled to receive certain stipulated amounts from the occupants of the premises. While this contract was in effect the city passed an ordinance which provided (*a*) that no unsewered privy should be erected or used on any property to which the public water supply was available and which was within three hundred feet of an existing sanitary sewer to which said property might be connected, (*b*) that all privies built within the city should be of an approved sanitary type, and (*c*) that no pit-type

sanitary privy should be constructed without written approval by either the county or city health officer. Under this ordinance the health authorities approved and encouraged the erection of pit-type sanitary privies, and a number of such privies had been, and were being, installed when the plaintiff brought an action on the ground that the ordinance and the action of the health department thereunder lessened the number of unsewered privies to be cleaned, amounting to an impairment of the obligation of his contract. He prayed that the city and its officers be prohibited from building or causing to be built the new type of pit privy.

The supreme court took the view that the plaintiff's contention as to the impairment of the obligation of his contract could not be sustained, stating in part as follows:

> * * * It is familiar law that the State cannot part with its rights to exercise the inherent attributes of sovereignty, among which undoubtedly is the police power. The retention and exercise of this power by the State is necessary for the protection of citizens and cannot by any means be bartered away. This applies to the police power delegated to municipal corporations. It is a continuing power which the municipality cannot part with by contract, or by any other means. This being the law, it follows that the city of North Little Rock was in the proper exercise of its powers in seeking the installation of privies which, in the judgment of the health authorities, would tend to preserve the health of its citizens although some damage might result to the appellant. Of this he cannot complain, for he took his contract subject to the exercise by the city of its police power whenever the need might arise.

The decree of the lower court in favor of the defendant city was affirmed.

DEATHS DURING WEEK ENDED MAY 25, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended May 25, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	8,752	8,242
Deaths per 1,000 population, annual basis	11.0	11.5
Deaths under 1 year of age	629	613
Deaths under 1 year of age per 1,000 estimated live births	49	57
Deaths per 1,000 population, annual basis, first 21 weeks of year	12.5	12.4
Data from industrial insurance companies:		
Policies in force	67,771,202	67,801,274
Number of death claims	13,004	13,024
Death claims per 1,000 policies in force, annual rate	10.1	10.0
Death claims per 1,000 policies, first 21 weeks of year, annual rate	10.7	10.9

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended June 1, 1935, and June 2, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 1, 1935, and June 2, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 1, 1935	Week ended June 2, 1934	Week ended June 1, 1935	Week ended June 2, 1934	Week ended June 1, 1935	Week ended June 2, 1934	Week ended June 1, 1935	Week ended June 2, 1934
New England States								
Maine	4				280	6	0	1
New Hampshire	1					101	0	0
Vermont					11	39	0	0
Massachusetts	9	11			376	911	3	0
Rhode Island		5	3		4[illegible]2	26	2	0
Connecticut	7			1	593	183	0	0
Middle Atlantic States								
New York	28	15	1[illegible]	1[illegible]	2,175	1,0[illegible]	23	6
New Jersey	11	21	9	5	1,931	652	6	0
Pennsylvania	18	27			2,168	2,[illegible]	9	0
East North Central States								
Ohio	32	37	62	38	2,038	2,309	14	0
Indiana	24	5	9	15	21[illegible]	900	0	1
Illinois	42	23	15	32	1,113	2,280	16	14
Michigan	7	12	3	3	2,018	121	2	1
Wisconsin	5	4	36	21	1,481	1,971	0	0
West North Central States								
Minnesota	10	6	2	1	279	218	0	1
Iowa	11	6		1	201	312	0	1
Missouri	20	27	37	13	333	315	8	3
North Dakota		6	4		47	69	0	0
South Dakota	4		1	1	21	219	0	2
Nebraska	19	1	1		313	90	1	0
Kansas	8	4			515	456	3	0
South Atlantic States								
Delaware	2				10	77	0	0
Maryland [2]	8	4	1	8	74	1,207	8	0
District of Columbia [3]	13	10	1		28	33	6	0
Virginia	10	9			380	915	2	1
West Virginia	9	8	11	7	305	161	3	0
North Carolina [4]	7	3	2	3	74	1,017	8	1
South Carolina	3	4	88	134	1	169	1	0
Georgia	1	2				99	0	0
Florida [4]	4	8	1	1	20	230	0	0

See footnotes at end of table

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 1, 1935, and June 2, 1934—Continued

Division and State	Diphtheria: Week ended June 1, 1935	Diphtheria: Week ended June 2, 1934	Influenza: Week ended June 1, 1935	Influenza: Week ended June 2, 1934	Measles: Week ended June 1, 1935	Measles: Week ended June 2, 1934	Meningococcus meningitis: Week ended June 1, 1935	Meningococcus meningitis: Week ended June 2, 1934
East South Central States								
Kentucky	[illegible]	[illegible]	[illegible]	9	10	[illegible]	[illegible]	0
Tennessee	[illegible]	[illegible]	[illegible]	11	11	[illegible]	1	2
Alabama[4]	10	9	1	[illegible]	[illegible]	[illegible]	0	0
Mississippi[2]		[illegible]					[illegible]	0
West South Central States								
Arkansas	[illegible]	2	[illegible]		51	11	1	0
Louisiana	1	11	4	[illegible]	[illegible]	13	1	1
Oklahoma[4]	11	4	31	1	[illegible]	10	1	0
Texas[4]	[illegible]	4	4	1	3	[illegible]	3	2
Mountain States								
Montana[3]		4	11	[illegible]	[illegible]		1	1
Idaho[4]		[illegible]			[illegible]	11	0	0
Wyoming[3]		1			[illegible]	11	1	0
Colorado	13	[illegible]			[illegible]	[illegible]	0	0
New Mexico	6	[illegible]	9		14	[illegible]	3	0
Arizona	[illegible]	[illegible]	6	9	[illegible]	[illegible]	4	0
Utah				2	[illegible]	31	0	0
Pacific States								
Washington[3]	1				401	102	1	0
Oregon		1	1	9	[illegible]	[illegible]	4	0
California	[illegible]		[illegible]	18	[illegible]	418	[illegible]	2
Total	43	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	40
First 22 weeks of year	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Division and State	Poliomyelitis: Week ended June 1, 1935	Poliomyelitis: Week ended June 2, 1934	Scarlet fever: Week ended June 1, 1935	Scarlet fever: Week ended June 2, 1934	Smallpox: Week ended June 1, 1935	Smallpox: Week ended June 2, 1934	Typhoid fever: Week ended June 1, 1935	Typhoid fever: Week ended June 2, 1934
New England States								
Maine	1	0	13	9	0	0	2	6
New Hampshire	0	0	20	6	0	0	0	6
Vermont	0	0	4	10	0	0	0	0
Massachusetts	0	0	216	230	0	0	3	2
Rhode Island	0	0	[illegible]	21	0	0	1	1
Connecticut	0	0	[illegible]	41	0	0	2	0
Middle Atlantic States								
New York	1	1	[illegible]	64	0	0	7	7
New Jersey	2	0	[illegible]	113	0	0	1	[illegible]
Pennsylvania	0	1	[illegible]	[illegible]	0	0	[illegible]	11
East North Central States								
Ohio	0	1	[illegible]	[illegible]	0	0	[illegible]	13
Indiana	0	0	[illegible]	71	0	2	7	8
Illinois	1	1	[illegible]	[illegible]	4	4	6	6
Michigan	1	0	[illegible]	[illegible]	0	1	[illegible]	4
Wisconsin	0	0	[illegible]	68	9	19	1	1
West North Central States								
Minnesota	1	0	[illegible]	[illegible]	10	3	3	2
Iowa	1	1	[illegible]	[illegible]	3	1	0	2
Missouri	0	1	48	[illegible]	4	1	8	8
North Dakota	0	0	40	41	0	0	2	1
South Dakota	0	1	12	4	5	1	0	0
Nebraska	0	0	38	14	[illegible]	5	4	0
Kansas	0	1	30	27	22	1	7	2
South Atlantic States								
Delaware	0	0	6	2	0	0	0	0
Maryland[2]	0	0	70	43	0	0	4	8
District of Columbia[2]	0	0	31	7	0	0	0	1
Virginia	2	0	20	18	0	0	12	7
West Virginia	1	1	58	47	0	0	6	11
North Carolina[4]	25	1	14	11	0	0	8	4
South Carolina	1	0	1	1	0	0	16	6
Georgia	1	0	2	2	0	0	3	14
Florida[4]	1	0	4		0	0	2	8

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 1, 1935, and June 2, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 1, 1935	Week ended June 2, 1934	Week ended June 1, 1935	Week ended June 2, 1934	Week ended June 1, 1935	Week ended June 2, 1934	Week ended June 1, 1935	Week ended June 2, 1934
East South Central States:								
Kentucky	0	0	24	27	0	0	3	14
Tennessee	0	0	18	19	0	2	11	8
Alabama [4]	2	0	7	5	0	0	7	5
Mississippi [2]	1	0	5	2	0	1	4	5
West South Central States:								
Arkansas	0	0	1	3	2	2	6	3
Louisiana	4	2	7	7	0	0	6	10
Oklahoma [5]	0	2	6	7	3	2	5	5
Texas [4]	0	0	28	36	21	33	10	23
Mountain States:								
Montana [3]	0	0	6	8	0	0	6	2
Idaho [4]	0	0	3	1	0	1	0	0
Wyoming [3]	0	0	8	17	5	0	0	0
Colorado [3]	0	0	172	22	3	2	0	0
New Mexico	0	0	9	6	1	0	3	2
Arizona	1	0	41	4	0	0	3	4
Utah [2]	0	0	117	6	0	1	0	0
Pacific States:								
Washington [3]	0	1	56	60	21	1	2	3
Oregon [1]	0	1	23	40	2	2	3	0
California	3	163	211	107	10	1	5	3
Total	50	179	5,831	4,188	187	86	197	228
First 22 weeks of year	566	771	135,197	128,750	4,168	3,223	3,108	3,690

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Rocky Mountain spotted fever, week ended June 1, 1935, 26 cases, as follows: District of Columbia, 1; Montana, 10; Wyoming, 9; Colorado, 2, Washington, 1; Oregon, 3
[4] Typhus fever, week ended June 1, 1935, 17 cases, as follows: North Carolina, 2; Florida, 1; Alabama, 8; Texas, 2; Idaho, 4.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
April 1935										
California	33	111	243	3	7,065	10	18	970	14	21
Nevada	2		10		57		0	19	1	0
New York	111	136		4	12,925		4	5,211	0	22
Oklahoma [1]	15	36	203	47	647	20	2	50	1	13
Puerto Rico		46	25	920	210		30		0	19
Tennessee	17	30	216	63	205	16	0	92	1	22
Washington	16	13	57		1,601		4	242	98	4
Wyoming		5			676		1	90	54	1

[1] Exclusive of Oklahoma City and Tulsa.

April 1935

	Cases
Actinomycosis:	
California	1
Anthrax:	
Oklahoma [1]	1
Chicken pox:	
California	4,483
Nevada	86
New York	3,497
Oklahoma [1]	63
Puerto Rico	213
Tennessee	164
Washington	678
Wyoming	25
Conjunctivitis:	
Oklahoma [1]	1
Dysentery:	
California (amoebic)	8
California (bacillary)	7
New York (amoebic)	3
New York (bacillary)	27
Oklahoma [1]	5
Puerto Rico	22
Epidemic encephalitis:	
California	1
New York	5
Tennessee	2
Washington	2
Filariasis:	
Puerto Rico	8
Food poisoning:	
California	20
German measles:	
California	3,727
New York	10,857
Tennessee	23
Washington	1,241
Granuloma, coccidioidal:	
California	1
Impetigo contagiosa:	
Oklahoma [1]	1
Jaundice:	
California	2

[1] Exclusive of Oklahoma City and Tulsa.

Disease and State	Cases
Leprosy:	
California	3
Mumps:	
California	1,7[illegible]
Oklahoma [1]	112
Puerto Rico	141
Tennessee	1[illegible]
Washington	[illegible]
Wyoming	4
Ophthalmia neonatorum:	
California	1
New York	11
Oklahoma [1]	1
Puerto Rico	4
Paratyphoid fever:	
California	2
New York	6
Tennessee	2
Washington	1
Psittacosis:	
California	1
Puerperal septicemia:	
Puerto Rico	4
Tennessee	1
Washington	1
Rabies in animals:	
California	122
New York [2]	3
Washington	6
Rocky Mountain spotted fever:	
Wyoming	8
Scabies:	
Tennessee	2
Septic sore throat:	
California	6
Nevada	1
New York	41
Oklahoma [1]	[illegible]
Tennessee	1
Washington	1
Wyoming	3
Tetanus:	
California	3
New York	3
Oklahoma [1]	2
Puerto Rico	10
Tetanus, infantile:	
Puerto Rico	2
Trachoma:	
California	36
Oklahoma [1]	10
Tennessee	9
Trichinosis:	
California	8
New York	12
Tularaemia:	
[illegible]	1
[illegible]	4
[illegible]	1
Typhoid fever:	
[illegible]	1
New York	2
[illegible]	1
Undulant fever:	
California	[illegible]
New York	[illegible]
Washington	3
Vincent's infection:	
New York [2]	[illegible]
Oklahoma [1]	1
Tennessee	3
Whooping cough:	
California	[illegible]
Nevada	10
New York	[illegible]
Oklahoma [1]	[illegible]
Puerto Rico	[illegible]
Tennessee	[illegible]
Washington	107
Wyoming	63
Yaws:	
Puerto Rico	2

[1] Exclusive of Oklahoma City and Tulsa.

[2] Exclusive of New York City.

PLAGUE-INFECTED GROUND SQUIRRELS IN LAKE COUNTY, OREG.

Two ground squirrels found dead in Lake County, Oreg., have been proved positive for plague. One squirrel was found on May 11, 1935, about 2 miles east, and one on May 23, about 25 miles northeast, of Lakeview.

WEEKLY REPORTS FROM CITIES

City reports for week ended May 25, 1935

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria, cases	Influenza Cases	Influenza Deaths	Measles, cases	Pneumonia, deaths	Scarlet fever, cases	Smallpox, cases	Tuberculosis, deaths	Typhoid fever, cases	Whooping cough, cases	Deaths, all causes
Maine:											
Portland	0		0	0	2	4	0	1	0	8	25
New Hampshire:											
Concord	0		0	0	1	1	0	0	0	0	11
Nashua	0			0		2	0		0	0	
Vermont:											
Barre	0		0	10	0	0	0	1	0	1	4
Burlington	0		0	13	0	0	0	0	0	0	8
Massachusetts:											
Boston	2		0	77	21	58	0	13	0	24	250
Fall River	1		0	7	0	11	0	1	0	0	28
Springfield	0		0	79	1	15	0	1	0	3	39
Worcester	0		0	5	5	28	0	0	0	0	44
Rhode Island:											
Pawtucket	0		0	0	0	0	0	0	0	0	17
Providence	0		0	416	5	9	0	0	0	4	68
Connecticut:											
Bridgeport	0	1	1	19	0	14	0	2	1	0	37
Hartford	0		0	17	4	10	0	2	0	15	38
New Haven	0		0	181	0	1	0	0	0	1	35
New York:											
Buffalo	0		0	39	11	81	0	5	0	10	161
New York	22	5	3	1,415	149	597	0	91	3	158	1,580
Rochester	0		0	68	6	17	0	1	0	14	79
Syracuse	0		0	512	3	25	0	1	0	17	88

City reports for week ended May 25, 1935—Continued

State and city	Diphtheria, cases	Influenza Cases	Influenza Deaths	Measles, cases	Pneumonia, deaths	Scarlet fever, cases	Smallpox, cases	Tuberculosis, deaths	Typhoid fever, cases	Whooping cough, cases	Deaths, all causes
New Jersey:											
Camden	1	----	1	3	4	3	0	1	0	4	34
Newark	0	2	0	124	9	11	0	7	0	54	104
Trenton	2	----	0	1	2	14	0	5	0	1	40
Pennsylvania:											
Philadelphia	6	4	1	94	31	99	0	21	2	79	529
Pittsburgh	2	4	1	293	23	52	0	9	0	21	160
Reading	0	----	0	141	1	5	0	0	1	1	23
Scranton	0	----	----	15	----	3	0	----	0	0	----
Ohio:											
Cincinnati	8	----	0	14	15	21	0	9	0	3	133
Cleveland	5	22	4	399	19	11	0	13	0	32	228
Columbus	0	2	2	83	3	21	0	1	0	1	73
Toledo	0	1	0	87	10	17	0	4	0	7	82
Indiana:											
Fort Wayne	5	----	0	3	5	2	0	0	0	1	36
Indianapolis	2	----	0	133	13	11	0	0	0	18	111
South Bend	0	----	0	7	4	6	0	0	0	1	16
Terre Haute	1	----	0	4	0	0	0	0	0	0	23
Illinois:											
Chicago	31	4	0	987	43	633	0	44	1	73	682
Springfield	1	----	0	10	5	6	0	0	0	0	20
Michigan:											
Detroit	8	3	2	910	24	128	0	12	0	110	273
Flint	3	----	0	4	8	16	0	0	0	5	40
Grand Rapids	0	----	0	173	4	17	0	0	0	24	33
Wisconsin:											
Kenosha	0		0	8	0	12	0	0	0	1	4
Milwaukee	0	1	1	438	2	93	0	3	0	25	78
Racine	0	----	0	183	1	11	0	0	0	11	12
Superior	0	----	0	20	0	1	0	0	0	3	6
Minnesota:											
Duluth	0	----	0	61	3	4	0	1	1	0	22
Minneapolis	4	----	0	35	6	88	0	0	0	20	86
St. Paul	0	----	0	12	10	53	1	1	1	7	69
Iowa:											
Davenport	1	----	----	0	----	3	0	----	0	0	----
Des Moines	3	----	0	16	0	3	1	0	0	0	40
Sioux City	0	----	0	0	0	0	0	0	0	2	0
Waterloo	2		----	2	----	8	0		0	0	----
Missouri:											
Kansas City	4	----	0	39	9	9	0	4	0	0	91
St. Joseph	1	----	0	3	2	4	0	2	0	3	44
St. Louis	12		0	19	9	15	0	9	0	6	176
North Dakota:											
Fargo	0		0	2	0	14	0	0	0	0	3
Grand Forks	0	----		0		0	0		0	1	----
South Dakota:											
Aberdeen	0			3		1	0		0	0	----
Nebraska:											
Omaha	2	----	0	78	3	6	1	4	0	0	44
Kansas:											
Topeka	----	----	----							----	----
Wichita	0	----	0	76	3	0	0	2	0	5	27
Delaware:											
Wilmington	1	----	0	7	5	6	0	1	0	1	21
Maryland:											
Baltimore	2	3	2	42	16	52	0	11	0	18	224
Cumberland	0	----	0	5	0	2	0	1	0	0	12
Frederick	0	----	0	2	0	1	0	0	0	0	3
District of Columbia:											
Washington	11	----	0	66	12	46	0	12	1	4	170
Virginia:											
Lynchburg	1	----	0	2	1	1	0	0	0	24	13
Norfolk	0	----	0	0	1	2	0	0	1	3	26
Richmond	1	----	0	32	2	3	0	2	0	1	44
Roanoke	0	----	0	13	1	0	0	0	1	0	13
West Virginia:											
Charleston	0	----	0	15	3	1	0	0	0	1	21
Huntington	0	----	----	10		3	0	----	0	2	
Wheeling	0	----	0	47	0	4	0	2	0	1	24
North Carolina:											
Raleigh	0		0	3	0	0	0	0	0	4	6
Wilmington	0	----	0	0	0	0	0	0	0	5	7
Winston-Salem	0	----	0	1	1	2	0	0	0	10	14

City reports for week ended May 25, 1935—Continued

State and city	Diphtheria, cases	Influenza Cases	Influenza Deaths	Measles, cases	Pneumonia, deaths	Scarlet fever, cases	Smallpox, cases	Tuberculosis deaths	Typhoid fever, cases	Whooping cough, cases	Deaths, all causes
South Carolina:											
Charleston	0	4	0	1	3	1	0	0	1	0	20
Columbia	0		0	0	2	0	0	0	0	0	17
Greenville	0		0	0	6	0	0	0	0	1	11
Georgia:											
Atlanta	4	6	0	3	3	3	0	0	2	12	80
Brunswick	0		0	1	0	0	0	0	0	3	2
Savannah	0		0	5	0	0	0	4	1	1	31
Florida:											
Miami	0	1	1	0	0	1	0	0	0	3	26
Tampa	0		0	15	1	0	0	2	2	1	24
Kentucky:											
Ashland											
Lexington	0		0	10	3	0	0	2	0	5	17
Louisville	0	2	0	120	7	10	0	2	0	6	70
Tennessee:											
Memphis	1		1	0	4	3	0	5	1	5	91
Nashville	0		0	1	3	0	0	1	0	6	44
Alabama:											
Birmingham	3		1	31	1	2	0	3	0	2	72
Mobile	1		0	6	0	0	0	1	1	0	14
Montgomery	0			0		0	0		1	1	
Arkansas:											
Fort Smith	0			4		0	0		0	4	
Little Rock	0			5	2	2	0	1	0	7	
Louisiana:											
New Orleans	8		0	10	12	1	0	8	1	0	131
Shreveport	0		0	0	6	0	0	3	2	2	33
Texas:											
Dallas	2		0	0	2	2	0	0	1	2	45
Fort Worth	1		0	0	2	1	0	1	0	0	32
Galveston	0		0	0	2	2	0	1	0	0	13
Houston	12		0	0	9	2	0	5	0	0	68
San Antonio	1		1	2	9	1	0	6	0	0	58
Montana:											
Billings											
Great Falls	0		0	1	4	0	0	0	0	16	10
Helena	0		0	6	0	0	0	0	0	13	6
Missoula	0		0	0	1	0	0	0	0	0	7
Idaho:											
Boise	0		0	0	1	0	0	0	0	0	10
Colorado:											
Denver	7		1	207	6	63	1	9	0	1	88
Pueblo	2		0	34	0	9	0	0	0	2	6
New Mexico:											
Albuquerque	0		0	3	2	0	0	2	0	0	14
Utah:											
Salt Lake City	2		0	0	2	101	0	2	0	100	31
Nevada:											
Reno	0		0	0	0	0	0	0	0	0	8
Washington:											
Seattle	1		2	180	9	10	2	6	1	12	89
Spokane	0	2	2	56	2	1	0	0	0	0	32
Tacoma	0			3		3	4		0	0	
Oregon:											
Portland	0	1	0	66	3	5	0	1	0	0	55
Salem	0	2		2		0	0		0	0	
California:											
Los Angeles	13	19	0	123	12	53	5	21	0	19	270
Sacramento	0	1	1	257	0	9	0	4	0	0	
San Francisco	0		0	138	6	21	0	8	0	40	146

City reports for week ended May 25, 1935—Continued

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Polio-myelitis cases	State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Polio-myelitis cases
Massachusetts:				Nebraska:			
Boston	0	0	1	Omaha	0	1	0
Rhode Island:				Maryland:			
Providence	1	1	0	Baltimore	8	5	0
New York:				District of Columbia:			
New York	7	6	2	Washington	10	3	0
Pennsylvania:				Virginia:			
Philadelphia	2	2	0	Lynchburg	1	0	0
Pittsburgh	1	1	0	Norfolk	1	2	0
Ohio:				North Carolina:			
Cincinnati	9	2	0	Raleigh	0	0	1
Toledo	1	0	0	Kentucky:			
Indiana:				Louisville	1	0	0
Indianapolis	1	0	0	Tennessee:			
Terre Haute	1	0	0	Nashville	1	1	0
Illinois:				Louisiana:			
Chicago	11	5	0	New Orleans	1	2	0
Springfield	1	0	0	New Mexico:			
Michigan:				Albuquerque	0	1	0
Detroit	1	1	1	Oregon:			
Wisconsin:				Portland	0	1	0
Milwaukee	1	0	0	California:			
Minnesota:				Los Angeles	2	1	3
Minneapolis	1	0	0	Sacramento	1	0	0
Missouri:				San Francisco	1	0	0
Kansas City	0	1	0				
St. Joseph	2	0	0				

Epidemic encephalitis.—Cases: New York, 1; Trenton, 1; Toledo, 1; Washington, 1.
Pellagra.—Cases: Charleston, S. C., 1; Atlanta, 1; Savannah, 4; Tampa, 1; Mobile, 2; New Orleans, 2.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended May 18, 1935.—During the 2 weeks ended May 18, 1935, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis					1					1
Chicken pox		1		407	417	55	24	3	174	1,081
Diphtheria		3	1	34	10	10	1		6	65
Dysentery				1						1
Erysipelas				12	5	4	1	3	2	27
Influenza		17	1		7				19	44
Measles		155	54	1,271	4,568	176	151	118	110	6,603
Mumps		28			437	256	8	32	26	787
Pneumonia		6			13		1		23	43
Poliomyelitis				1						1
Scarlet fever		26	4	361	272	14	15	13	56	761
Trachoma						2	1		2	5
Tuberculosis	3	65	18	168	70	20	17	1	33	395
Typhoid fever			2	39	6		2	6	1	56
Undulant fever							2			2
Whooping cough		4	2	185	211	55	126	7	126	716

DENMARK

Communicable diseases—January–March 1935.—During the months of January, February, and March 1935, cases of certain communicable diseases were reported in Denmark, as follows:

Disease	January	February	March	Disease	January	February	March
Cerebrospinal meningitis	4	4	10	Paradysentery	168	40	20
Chicken pox	34	66	45	Paratyphoid fever		6	11
Diphtheria and croup	430	379	373	Poliomyelitis	75	32	31
Epidemic encephalitis	2	6	8	Puerperal fever	16	15	18
Erysipelas	310	301	289	Scabies	1,019	780	710
German measles	15	17	55	Scarlet fever	740	625	604
Gonorrhea	883	685	705	Syphilis	82	79	77
Influenza	7,915	13,746	31,280	Tetanus neonatorum	4	3	2
Malaria	13	6	7	Typhoid fever	4	2	
Measles	11,722	13,205	13,677	Undulant fever (Bact. abort. Bang)	38	48	37
Mumps	811	910	947	Whooping cough	2,523	2,317	2,300

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for May 31, 1935, pp. 749-763. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued June 28, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Plague

Argentina—Victorica. According to information dated May 17, 1935, 1 suspected case of bubonic plague was reported at Victorica, La Pampa Territory, Argentina.

Bechuanaland Protectorate. On April 18, 1935, numerous plague-infected rodents were found in the districts of Gaberones and Lobatsi and also in the Bamalete, Batlokwa, Bakwena, and Bakgatla Reserves. On April 20 and May 1, 1935, respectively, 2 cases of human plague were reported.

United States—Oregon. A report of plague-infected ground squirrels in Oregon appears on page 824 of this issue of PUBLIC HEALTH REPORTS.

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HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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BENIGN LYMPHOCYTIC CHORIOMENINGITIS (ACUTE ASEPTIC MENINGITIS)

A New Disease Entity

By CHARLES ARMSTRONG, *Surgeon, United States Public Health Service*, and PAUL F. DICKENS, *Lieutenant Commander, Medical Corps, United States Navy*

It has often proved difficult to establish an etiologic diagnosis in the case of patients showing signs and symptoms of cerebrospinal involvement, especially when the cellular response in the cerebrospinal fluid is predominantly lymphocytic in character; and occasionally cases are met in which heretofore it has not been possible to detect any living etiologic agent. For that reason, the term "acute aseptic meningitis" has been proposed as most nearly descriptive. The purpose of this paper is to show that some, if not all, of such cases represent a disease entity due to a filterable virus (Armstrong)

Viets and Watts (*1*, *7*) report 14 cases of meningitis characterized by an acute onset, headache, vomiting, and moderate fever. There was some degree of blurring of the optic disk in all cases. The cerebrospinal fluid showed a marked lymphatic pleocytosis with but few polymorphonuclear cells. Slight protein increase was noted; but the sugar and chloride content were within the normal range. No organism could be obtained. The spinal fluid pressure was higher than normal. The disease reported was self-limited, lasting from 3 to 6 weeks, and recovery took place without residual paralysis.

In 1932 Dickens (*2*) reported two cases of acute aseptic meningitis under the title of "acute aseptic (lymphocytic) meningitis", and asked the question: "Is this a new disease entity due to a filterable or nonfilterable virus?" In this article it is our intention to answer this question and (*a*) to present the clinical picture of acute aseptic meningitis in the human and the monkey; (*b*) give the laboratory findings common to this condition; (*c*) present immunological evidence that the etiology is a specific virus first described by Armstrong and Lillie of the National Institute of Health (1934); (*d*) report additional cases; and (*e*) demonstrate that human blood serum from patients recovered from the disease protects animals from the specific virus.

The clinical picture of the disease is that of an infection of the upper respiratory tract, followed by meningeal symptoms which are ushered in by sudden onset with headache, nausea or vomiting, rise in tem-

perature to 100°-103° F., stiff neck, and usually a positive Kernig's sign. There is no evidence of nerve involvement, and other than noted above the neurological examination is negative. The disease runs a benign course for about 10 days to 2 weeks. The temperature declines by lysis, and recovery is complete without residual of any kind. Four patients who have been "followed up" for more than 3 years remain entirely well.

The cerebrospinal fluid is under slight increase in pressure and is clear or at the most slightly hazy. The cellular response is almost entirely lymphocytic rarely do we find as many as 10 percent polymorphonuclear leucocytes in the fluid. The number of cells may range anywhere from 50 to 2,000, according to the severity of the attack. The chemistry of the cerebrospinal fluid is important in that the sugar, chlorides, and urea content will be found within normal range. The Kahn or Wassermann is negative, and the colloidal gold curve is in the meningitic zone and of low color change. No organism or clot can be demonstrated. Drainage of a few cubic centimeters of cerebrospinal fluid will usually relieve the headache and nausea and quiet the patient. The white blood cell count may show a slight increase, up to 9,000 or 11,000, with a fairly normal differential percentage. That the cerebrospinal fluid shows no tendency to clot and that the sugar and especially the chlorides remain within normal limits are most important diagnostic points definitely against tuberculous meningitis, with which the disease is at first often confused. The fact that no muscle weakness or definite neurological signs are found helps to rule out encephalitis (all types) and acute anterior poliomyelitis.

The etiology is in all probability a filterable virus recovered by Armstrong and Lillie and reported in 1934 and 1935 (*3*, *4*). In August 1934 Armstrong called attention to a virus which he had recovered and which differed from any with which he was then familiar. It was encountered in the course of virus transmission work on monkeys, and it is uncertain whether the infection originated independently in the animals used or was inoculated with material from a human source. Monkeys seem to be usually susceptible, as are mice and guinea pigs, the infection producing in monkeys, as in man, a uniform symptom complex. On the fourth to the eighth day after inoculation with the virus the temperature rises to 104°-105° F., continuing at this elevation for 3 to 10 days. Defervescence is by lysis. The blood leucocyte count ranges from 10,000 to 19,000 per mm^3. The cerebrospinal fluid is clear, or at most slightly hazy, is under slight increase in pressure, and contains from 150 to 3,000 cells per mm^3, these being almost entirely lymphocytes. (The average normal cerebrospinal fluid cell count in a series of control monkeys was 19 lymphocytes.) The chemistry of the cerebrospinal fluid does not deviate from normal range.

In the series of sick monkeys the sugar averaged 61, sodium chloride 891, and the urea nitrogen 17.6 mg per 100 cc. (In the series of 10 control monkeys the average content per 100 cc of cerebrospinal fluid was sugar 56, sodium chloride 812, and urea nitrogen 16 8 mg) The sick animal characteristically sits quietly with head drooping and eyes closed, but is easily aroused; and if disturbed sufficiently to make it move, the motions are slow and hesitating, as if the muscles were stiff. Armstrong (*3*) stated that the human disease most nearly resembling this disease in monkeys is, perhaps, the so-called "lymphocytic or aseptic meningitis" described by Wallgren, Viets, and Watts, Dickens, Bloedorn, and others, and demonstrated protective antibodies in the serum of a recovered case (*4*) Traub (*9*) recently recovered a virus from white mice which appeared to resemble closely the virus isolated by Armstrong. Soon thereafter (May 2, 1935), Rivers and Scott reported the isolation of a similar virus from 2 cases of meningitis, and stated that the serum from these cases protected animals from this virus. An exchange of protective sera was made with Traub in order that a serological comparison of the two viruses could be made. At the same time Traub tested two strains of his virus against the immune monkey serum of the National Institute of Health. The results of both tests are shown in tables 1 and 2.

TABLE 1.—*Armstrong's experiment using Traub's immune serum against the National Institute of Health virus (Armstrong)*

4 mice in each group inoculated intracerebrally with each virus-serum mixture

Armstrong virus suspension (dilution)	Traub G P immune serum (survived)	Monkey no 883, immune serum (survived)	Control negative monkey serum (survived)	Control negative human serum (survived)
1 1,000	3	4	1	0
1 6,666	4	3	0	0
1 33,333	3	4	0	1

SECOND TEST

Armstrong virus suspension (dilution)	Traub G. P. immune serum (survived)	Monkey no. 311 (survived)	Control negative, monkey no 67 (survived)	Control negative, monkey no 584 (survived)
1:1,000	4	4	0	1
1 6,666	3	4	1	0
1:33,333	4	3	0	0

TABLE 2.—*Traub's experiment using National Institute of Health immune serum against his virus*

1 guinea pig inoculated with each dilution

Traub virus, strain	Dilution	Immune serum, Armstrong, (monkey)	Normal human serum (control)	Normal monkey serum (control)
A	1 100	Survived	Died	Died
	1 1,000	do	do	Do
	1 10,000	do	Survived	Survived
B	Undiluted	do	Not used	Died
	1 10	do	do	Do
	1 100	do	do	Do
	1 1,000	do	do	Do

Summarizing the results of these tests it is seen that serum from guinea pigs rendered immune to Traub's virus protected animals inoculated with Armstrong's virus, and that serum from monkeys rendered immune to Armstrong's virus protected animals inoculated with Traub's virus. The results of these two independent tests indicate that the Armstrong and Traub viruses are identical (serologically).

Rivers and Scott (*10*) have also isolated a virus from two human cases of meningitis which appears to be immunologically identical with the Armstrong virus. From Rivers, mice were obtained, which had been rendered immune to his virus, together with mice from the same stock for normal controls, and Armstrong conducted tests in which these mice were inoculated with his virus. The results, which are shown in table 3 indicate the serological identity of the viruses.

TABLE 3.—*Armstrong's experiment using Rivers' immune and normal mice inoculated with the National Institute of Health virus*

12 mice in each group inoculated with 1 500 suspension of Armstrong virus

	Rivers' mice		National Institute of Health normal mice
	Immune	Normal	
FIRST TEST			
1	Survived	Died	Died
2	do	do	Do.
3	do	do	Do
4	do	do	Do
5	do	do	Do
6	do	do	Survived.
SECOND TEST			
1	Survived	Died	
2	do	do	
3	do	do	
4	do	do	
5	do	do	
6	do	do	

Further confirmatory work was done by Rivers, using his virus against Armstrong's immune serum, Traub's immune serum, and Rivers' serum in tests on guinea pigs, inoculating the serum-virus mixtures subcutaneously. The results are shown in tabular form and indicate the immunological identity of the Armstrong virus, the Traub virus, and the Rivers' virus (tables 3 and 4).

TABLE 4.—*Rivers' experiment using his virus against immune sera of Armstrong, Traub, and Rivers*

Guinea pigs inoculated subcutaneously with serum-virus mixtures. Time of death averaged 10-11 days. Animals observed 3 weeks

	Virus dilution	Normal human serum	Armstrong immune serum	Rivers' immune serum	Traub immune serum
1	1:10	Died	Survived	Survived	Survived
2	1:100	do	do	do	Do
3	1:1,000	do	do	do	Do

NOTE.—Data on experiments of Traub and Rivers taken from personal communication to Armstrong and inserted here in order to give proper credit to these workers.

CASE REPORTS

CASE 1

White female, aged 19, unmarried. First seen May 13, 1931, complaining of severe headache, more marked over the frontal region, nausea, vomiting, and pain in the epigastrium. Patient stated that for several days previous to the onset of the acute symptoms she had had a cold, and that she had not felt well for about 2 weeks.

Physical examination.—Temperature 100° F., pulse 92, and respiration 20. There was some slight tenderness over the frontal sinuses, which, however, transilluminated equally and well. The chest was clear to auscultation and percussion. The heart showed an occasional extrasystole. The abdomen was negative except for slight tenderness over the epigastric region.

Laboratory examination.—Urine showed a slight trace of albumin; white blood count 6,000; differential: polymorphonuclear leucocytes 58 percent with 5 percent band forms, lymphocytes 36 percent, and monocytes 1 percent. A provisional diagnosis of influenza was made.

Course.—The following day the temperature rose to 102°. She complained of severe headache. Examination revealed a well-marked rigidity of the neck, and a suggestive Kernig's sign. A spinal puncture was done, with relief of the headache; 15 cc of clear fluid was obtained under no apparent increase in pressure. The cell count was 590, with 80 percent lymphocytes, and 20 percent polymorphonuclear leucocytes. Smears were negative for organisms. The Wassermann and colloidal gold tests on the spinal fluid were negative. Urea N 10, sugar 60, and chlorides 712 mg per 100 cc of spinal fluid. On the

third day the temperature was 99.4°, but the rigidity of the neck was decidedly more marked and there was retraction of the head. Nausea and vomiting continued. A second spinal tap was done and 30 cc of fluid were obtained. The pressure was 18 mm Hg; cell count 3,200, with 96 percent lymphocytes and 4 percent polymorphonuclear leucocytes. Smears and cultures were negative for organisms. Sugar 60 mg, urea N 12, chlorides 712 mg per 100 cc of spinal fluid. The impression at this time was "tuberculous meningitis." On the fourth day the headache decreased in severity; there was no vomiting and little nausea. The rigidity of the neck, and retraction of the head continued, and Kernig's sign was positive. Spinal puncture was repeated; 4 cc of fluid under 4 mm Hg pressure were removed. Cell count 2,900, with 86 percent lymphocytes, and 14 percent polymorphonuclear leucocytes. On the sixth day the temperature remained normal and the patient showed improvement. From this time on there was steady improvement. The white cell count of the blood during the illness varied from 6,600 to 8,700; the differential count showing an average of 61 percent polymorphonuclear leucocytes, and 32 percent lymphocytes. On the thirteenth day of the illness the spinal fluid showed 38 cells, of which 93 percent were lymphocytes, and 7 percent polymorphonuclear leucocytes. Sugar 75 mg, Urea N 15, and chlorides 730 mg per 100 cc of spinal fluid.

The patient made an uneventful recovery and in 6 weeks was apparently well. At no time was there any evidence of cranial nerve involvement or any other significant localizing neurological findings. She has been under observation since then and has been free from symptoms.

On April 25, 1935, or 3 years and 11 months after the illness, blood serum was obtained from this patient and her serum protected mice against the virus of Armstrong (table 5).

TABLE 5.—*Virus-serum protection test on case 1*

4 mice inoculated with each virus dilution in each group (Armstrong, Apr. 25, 1935)

Serum	Virus dilution	Mouse deaths by days after inoculation											Survived
		1	2	3	4	5	6	7	8	9	10	11	
Case 1 (Dickens)	1:500				1								3
	1:3,333								1				3
	1:16,666												4
Positive control case MT [1]	1:500												4
	1:3,333												4
	1:16,666	1											3
Negative control, case RT	1:500							2	2				0
	1:3,333								3		1		0
	1:16,666									3		1	0
Normal monkey	1:500								3		1		0
	1:3,333									3	1		0
	1:16,666									1		1	2

[1] Report of case published in PUBLIC HEALTH REPORTS for Apr. 19, 1935.

CASE 2

(Reported by courtesy of Dr. Walter A. Bloedorn)

White male, aged 28. The patient was first seen on April 2, 1934, at which time he complained of headache, nausea, and vomiting, stiff muscles, and fever. He stated that 3 days previously he was suddenly taken ill with severe headache, coryza, and fever.

Physical examination. The patient was a well-developed, somewhat obese male; he did not look toxic, or gravely ill. The only significant findings were stiffness of the neck, a positive Kernig's sign, and a temperature of 101° F.

Laboratory examination.– Red blood cells 4,800,000; white blood cells 10,200; differential - polymorphonuclear leucocytes 66 percent (segmented 50 percent, bands 16 percent), lymphocytes 30 percent, monocytes 4 percent. Spinal fluid cell count 1,260, almost exclusively lymphocytes (8 red blood cells, and 2 polymorphonuclear leucocytes were seen); globulin positive; chlorides, estimated as sodium chloride, 690 mg per 100 cc; sugar 60 mg per 100 cc. Kahn and Wassermann were negative; colloidal gold curve 0011221100. Culture negative after 48 and 72 hours and on the seventh day. Animal inoculation was negative for tuberculosis. Due to the sudden onset, absence of tuberculosis elsewhere in the body, and absence of paralysis and muscle weakness, together with the relief of the main symptoms and lowering of the body temperature by spinal puncture, Bloedorn made a tentative diagnosis of aseptic meningitis, which was confirmed by the laboratory findings. The illness lasted one week, was of a mild nature, and recovery was complete without residual manifestations. On April 8, 1935, 1 year after the illness, blood serum was obtained from this patient, and his serum protected mice and monkeys from the virus of Armstrong (table 6).

TABLE 6. *Virus serum protection test on case 2*

Virus of experimental choriomeningitis 1 part (various dilutions) plus 1 part serum, mixed and incubated for 1 hour at 37° C. and then inoculated intracerebrally into white mice (0.03 cc virus serum mixture given to each of 4 mice) (Armstrong, Apr. 8, 1935)

Serum	Virus dilution	Mice deaths by days following inoculation												Survived
		1	2	3	4	5	6	7	8	9	10	11	12	
Case 2 (Bloedorn)	1:500										1			3
	1:3,333													4
	1:10,000				1									3
Immune monkey (positive control).	1:500											1		3
	1:3,333													4
	1:10,000													4
Garner (negative control)	1:500					1		1	2					0
	1:3,333									3				[1] 1
	1:10,000								1	1		1		[1] 1

[1] These 2 mice were discharged through error on the eleventh day.

CASE 3

White male, aged 33. First seen October 28, 1931, complaining of a severe headache, more marked at the occiput, nausea, and general soreness of the muscles. Patient stated that 2 weeks previously he had had a severe cold which had cleared within a week, but which was followed by herpes labialis.

Physical examination. Temperature 102°, pulse 88, respiration 20. Residuals of herpes noted about nose and lips. There was no rash or erythema. The throat was moderately inflamed; tonsils had been removed. There was some stiffness and tenderness of the neck. The posterior cervical lymph glands and inguinal glands were palpable. Lungs, heart, and abdomen normal; blood pressure 130/80.

Neurological examination. Bilateral Kernig and hyperactive knee-kicks; ophthalmoscopic examination showed some blurring of the disk margins.

Laboratory examination.—Urine negative; red blood count, 4,850,000; hemoglobin 85 percent, white blood cell count 8,000; differential—polymorphonuclear leucocytes 60 percent, lymphocytes 35 percent, monocytes 5 percent. Blood Kahn negative.

Spinal fluid

Day	Date	Cells [1]	Pressure mm of Hg	Protein	Sugar	Ch rid
1	Oct. 28	1,255	20	60	70	700
2	Oct. 29	1,540	15	60	65	650
5	Nov 1	950	10		50	700
9	Nov 5	722	7	40	60	675
14	Nov. 10	120	7	20	55	720
20	Nov. 16	18	10	22	64	680

[1] The cells of the spinal fluid were exclusively lymphocytes.

Smears and cultures from the fluid were negative for organisms. Animals inoculated and killed 5 weeks later showed no evidence of tuberculosis. There was no pellicle formation. Colloidal gold curve, 0011211000. X-ray of the head and chest negative for tumor, abscess, or tuberculosis.

Course.—The spinal taps relieved the headaches, and upon two occasions the patient asked for the spinal tap to ease the pain. The treatment was essentially symptomatic and nursing. The temperature the first 8 days ranged from 99.5° F. in the morning to 102° F. in the afternoon. On the eleventh day of the illness the temperature fell to normal and remained there. Recovery was without incident, and 6 weeks later the patient was apparently well. A check-up 2 months later showed the patient to be in good health. On April 20, 1935, 3½ years after the illness, blood serum obtained from this patient protected mice from the National Institute of Health strain of virus.

TABLE 7.—*Virus-serum protection test*

Four mice inoculated with virus dilution in each group (Armstrong)

Serum	Virus dilution	Mouse deaths by days following inoculation											Survived
		1	2	3	4	5	6	7	8	9	10	11	
Case 3 (Dickens)	1:500						1						3
	1:3,333							1					3
	1:16,666												4
Positive control (human serum)	1:500												4
	1:3,333												4
	1:16,666												4
Negative control (human serum)	1:500							3	1				0
	1:3,333								2	1	1		0
	1:16,666									1		3	0
Negative control (monkey serum)	1:500						1	1	2				0
	1:3,333							1	3				0
	1:16,666									1	2		1

CASE 4

White female, nurse, age 20. First seen March 15, 1935, at which time patient complained of a cold, severe headache, nausea, and vomiting, disturbances in vision, and pain in the sinuses. She stated that she had an acute attack of sinusitis in January 1935.

Physical examination.—Temperature 100.8° F., pulse 90, respiration 20. There was some blurring of the optic disks, and there was a positive Brudzinski sign together with a positive Kernig sign, otherwise the examination was essentially negative.

Laboratory examination.—Urine negative; red blood count 4,500,000, hemoglobin 85 percent, white blood cell count 8,000, differential—polymorphonuclear leucocytes 69 percent, lymphocytes 21 percent, monocytes 10 percent. Blood Kahn negative. Spinal fluid—cell count 209, exclusively lymphocytes; no organisms noted in the smear; the pressure showed no significant increase; and the fluid was practically clear.

Course.—Throughout the illness the main symptoms were headache, nausea, and vomiting. The temperature maintained a level of 100.8° F. for 3 days, dropped to normal for 1 day, and fluctuated between 99° and 100° F. for 3 more days before dropping to normal and remaining there. Spinal taps gave the patient relief early in the illness, but caused some reaction in the form of headache later on in the course of the disease. On the fifth day the blood examination was as follows: Red blood cell count 4,500,000, hemoglobin 85 percent, white blood cell count 9,500, differential—polymorphonuclear leucocytes 44 percent, band forms 5 percent, eosinophiles 3 percent, lymphocytes 41 percent, monocytes 7 percent. Blood chemistry: Urea 12, sugar 91, and chlorides 675 mg per 100 cc. Spinal fluid on the third day of the illness: Cell count 409, exclusively lymphocytes, sugar 60, and chlorides 775 mg per 100 cc; no organisms could be found by smear, and cultures of the fluid were negative. Kahn and Wassermann negative

and the colloidal gold curve was 000322221. On the tenth day of the illness the spinal fluid cell count was 22, all lymphocytes; there was no pellicle or clot formation in the fluid. On the twenty-first day the chloride content of the spinal fluid was 775 mg per 100 cc, and the colloidal gold curve was 0000000000. The blood counts were essentially normal. The treatment other than the spinal taps was essentially symptomatic and nursing. The patient made a gradual and uneventful recovery, and 1 month later was feeling well.

On March 24, 1935, or on the tenth day of illness, blood serum obtained from this patient did not protect animals inoculated with the virus of Armstrong; however, on May 15, 1935, 2 months after the onset of the illness, her blood serum did protect the animals inoculated with the virus of Armstrong (table 8).

It will be noted that, in human beings, as in the experimental animals, the blood serum does not have protective power in preventing the disease until after the second week of the illness. This case is important in that the serum was not protective early in the disease, but became definitely protective after the illness, probably indicating definite immunity.

TABLE 8.—*Virus-serum protection test*

4 mice inoculated with virus dilution in each group

Serum	Virus dilution	Mouse deaths by days following inoculation												Survived
		1	2	3	4	5	6	7	8	9	10	11	12	
Case 4 (Dickens)	1:500													4
	1:3,333													4
	1:16,666													4
Negative control (Ill. serum no. 140).	1:500							2	1	1				0
	1:3,333							2	1			1		0
	1:16,666										2			2

It is believed that these are important observations in that they seem to prove that we are dealing with a new disease entity caused by a virus that was independently isolated by Armstrong and Lillie (3), Traub (9), and Rivers and Scott (10), and that the serum of patients recovered from this disease protects animals against this virus.

SUMMARY

(1) A symptom complex of headache, fever, meningeal irritation, cerebrospinal fluid under increased pressure, with an increase in cells (with a lymphocytic response dominant) above 50, coupled with a normal chloride, sugar, and urea content in the cerebrospinal fluid and a negative spinal fluid Wassermann, is a clinical entity which has previously been designated in man as *acute aseptic meningitis*.[1]

[1] Since the ailment here considered is caused by a virus, "aseptic" is a misnomer, and consequently we prefer to denote the condition by the term (*3, 4*) "acute lymphocytic choriomeningitis."

(2) The virus of Armstrong produces a symptom complex in monkeys similar to the above.

(3) The blood serum of patients recovered from the disease protects animals from the virus of Armstrong (National Institute of Health strain).

(4) This disease occurs sporadically in man and has been transferred experimentally to animals.

(5) Traub has isolated a virus from white mice and Rivers and Scott have isolated a virus from human patients which are serologically identical with the National Institute of Health strains of the Armstrong virus.

(6) Cases reported in this paper and by Dickens (*2*) and Armstrong (*3*) cover scattered geographical areas, having their origin in California, Maryland, District of Columbia, Illinois, Ohio, and Virginia.

CONCLUSIONS

(1) The symptom complex is a disease entity.

(2) This condition by priority should be designated "acute aseptic meningitis" (*7*, *8*), but in view of the recent advance in the knowledge of its etiology, this designation is a misnomer, and we suggest the designation "acute lymphocytic choriomeningitis" as a more accurate designation (*3*, *4*).

(3) The etiological agent is a filterable virus first described by Armstrong and Lillie (*3*).

(4) The blood serum of patients recovered from "acute aseptic meningitis" protects animals from the virus. This may be used to confirm the diagnosis.

(5) Monkeys, mice, and guinea pigs are susceptible to the virus, and it is conceivable that a reservoir of the disease may exist in animals.

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(10) Rivers, T. M, Scott, T. F. M.: Meningitis in man caused by a filterable virus. Science, *81*: 439, May 3, 1935.

THE DETERMINATION AND CONTROL OF INDUSTRIAL DUST

A treatise on the engineering methods employed in studying the industrial dust problem has just been issued by the Public Health Service.[1] When one realizes that the workmen employed in the dusty trades comprise the largest group exposed to any one industrial hazard, it is quite apparent that this problem is one of major importance to the industrial hygienist. Furthermore, it is now well established that exposure to certain kinds of dusts, such as those containing considerable amounts of quartz, has increased the morbidity and mortality rate from respiratory diseases; while metallic dusts, such as lead and its compounds, have been associated with general systemic poisoning of workers.

In view of the fact that certain kinds of dusts have been known to produce definite damage to the workers exposed to them it is obvious that a knowledge of the properties of a given dust, which determines its capacity to produce injurious effects, is essential. Experience has shown that these properties are the composition of the dust, the quantity suspended in the industrial atmospheres, and its particle size.

In order to study all these factors involved in the industrial dust problem, it is necessary to conduct careful investigations. Such studies in industry serve a threefold purpose. First, they enable one to evaluate the extent of the hazard; this is accomplished by obtaining occupational dust exposures, which disclose the dust-creating tasks. Second, if clinical studies are also made, dust counts may indicate the permissible amount of dust which may be breathed with impunity. Third, dust determinations are used in an attempt to control the hazard; this is effected by testing the efficiency of such devices which have been developed for this purpose.

The recent bulletin describes the methods and instruments used in conducting dust studies in industry and discusses the manner of interpreting the results of such studies and their practical application to industrial problems, especially those phases dealing with the control of the dust hazard. The material in this bulletin is based largely on the practical experience gained by the authors in engineering studies of the dust problem in numerous industries in the United States. The first five chapters of the bulletin deal with various dust-

[1] The determination and control of industrial dust. By J. J. Bloomfield and J. M. DallaValle. Public Health Bulletin No. 217. Government Printing Office, Washington, 1935.

sampling instruments, the methods employed in studying the character, composition, and concentration of dusts, and the application of dust determinations to practical problems. The remaining seven chapters deal with general dust-control methods, the design of local exhaust systems, and the means used in collecting and disposing of the dust removed from the workrooms. In addition, a discussion is presented on the instruments employed in measuring air flow and the problem of personal respiratory protection. The bulletin contains 39 tables, 77 figures, and an extensive bibliography covering some 73 sources of reference. It is hoped that this volume will meet the needs of engineers, chemists, industrial managers, and others interested in the control of the industrial dust problem.

COURT DECISION ON PUBLIC HEALTH

Employment of county nurse.—(Georgia Supreme Court; *Williams et al.* v. *Board of Education of Gwinnett County et al.*, 178 S. E. 148; decided Jan. 16, 1935.) The statutes of Georgia relating to county boards of health provided that such boards should have full power to adopt regulations deemed necessary and proper for protecting the health of their respective counties and for preventing the introduction, generation, and spread of communicable diseases therein. It was also provided that, before such regulations as might be established should have the force of law, they should have the written approval of not less than three reputable physicians of the county, should be posted at the county courthouse door, and should be published at least once in the newspaper of the county in which the sheriff's notices were advertised. In an injunction suit brought against a county board of education and others, the supreme court, in a syllabus opinion, stated in part as follows:

1. An examination of the entire statute creating the "county boards of health" and specifying their powers and authority now contained in the code of 1933, chapter 88, discloses that such board has no power to employ a county nurse. Under the facts of this case the board did not employ a county nurse. The nurse was employed by the county board of commissioners of roads and revenues. It is admitted that there was no compliance with the requirement of the statute as to making and publishing rules and regulations. It is insisted by the defendants that compliance therewith is discretionary. The contrary construction seems to be demanded by the words of the statute, that compliance is necessary "before the same shall have the force of law." Inasmuch as this involves the expenditure of public funds which must be raised by taxation, the loose construction for which the defendants contend is not authorized. The accepted and safer construction of such statutes is to require full compliance with their express provisions. For that reason the county board of health was not authorized and empowered to negotiate with the county board of commissioners of roads and revenues, as was done in this case, for the employment of a county nurse.

* * * * * * *

3. The county board of commissioners of roads and revenues is not authorized to pay from the county treasury the salary of a county nurse, based upon the recommendation of the county board of health, until the county board of health has fully complied with the requirements of the statute authorizing them to act; * * *

DEATHS DURING WEEK ENDED JUNE 1, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended June 1, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	8,245	8,005
Deaths per 1,000 population, annual basis	11.5	11.2
Deaths under 1 year of age	586	596
Deaths under 1 year of age per 1,000 estimated live births	54	54
Deaths per 1,000 population, annual basis, first 22 weeks of year	12.4	12.3
Data from industrial insurance companies:		
Policies in force	67,801,303	67,823,174
Number of death claims	10,469	11,190
Death claims per 1,000 policies in force, annual rate	8.1	8.6
Death claims per 1,000 policies, first 22 weeks of year, annual rate	10.5	10.8

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for weeks ended June 8, 1935, and June 9, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 8, 1935, and June 9, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 8, 1935	Week ended June 9, 1934	Week ended June 8, 1935	Week ended June 9, 1934	Week ended June 8, 1935	Week ended June 9, 1934	Week ended June 8, 1935	Week ended June 9, 1934
New England States:								
Maine	1				157	28	0	0
New Hampshire						100	1	0
Vermont		1			25	65	0	0
Massachusetts	5	9			451	980	0	0
Rhode Island	1				601	32	2	0
Connecticut	5	4	3	1	761	260	1	2
Middle Atlantic States:								
New York	35	55	[1] 6	[1] 4	3,478	1,387	29	5
New Jersey	14	17	8	11	2,454	746	4	2
Pennsylvania	43	54			2,481	2,637	2	0
East North Central States:								
Ohio	18	19	7	4	1,414	925	7	1
Indiana	11	17	6		155	626	8	0
Illinois	46	30	20	8	1,412	2,414	19	4
Michigan	8	6	1	3	2,888	356	0	2
Wisconsin	1	1	22	23	1,953	2,095	1	2
West North Central States:								
Minnesota	4	8		3	351	167	1	0
Iowa	4	7	2		220	263	2	0
Missouri	26	35	10	12	107	117	10	2
North Dakota	1	5	1		11	45	0	0
South Dakota [3]	2	2	1		31	131	0	0
Nebraska	4	0			183	119	1	0
Kansas	4	0	1	1	380	454	1	0
South Atlantic States:								
Delaware	2	2			26	56	0	0
Maryland [2,3]	6	8	4	3	96	806	10	0
District of Columbia	7	6		2	34	21	10	1
Virginia [3]	6	9			357	955	18	0
West Virginia	11	11	23	15	180	143	1	1
North Carolina [3]	9	13	1	14	50	909	1	2
South Carolina [4]	10	8	67	100	18	119	0	0
Georgia [4]	8	1				121	0	0
Florida [4]	3	9		1	19	155	2	0
East South Central States:								
Kentucky	3	11	2	5	147	293	1	0
Tennessee	7	6	46	11	27	250	8	8
Alabama [4]	5	8	15	7	80	238	4	1
Mississippi [3]	9	3					0	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 8, 1935, and June 9, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 8, 1935	Week ended June 9, 1934	Week ended June 8, 1935	Week ended June 9, 1934	Week ended June 8, 1935	Week ended June 9, 1934	Week ended June 8, 1935	Week ended June 9, 1934
West South Central States:								
Arkansas	6	6	21	17	36	27	0	1
Louisiana	9	11	2	7	36	175	1	1
Oklahoma [5]	11	5	51	21	63	71	6	0
Texas [4]	28	46	98	142	85	875	1	0
Mountain States:								
Montana [2]	2	1	15	2	324	48	1	0
Idaho [4]			1		3	10	0	0
Wyoming [2]					18	111	0	0
Colorado	3	14			330	544	0	0
New Mexico	5	1	2		8	49	0	1
Arizona	6	2	6		18	7	0	0
Utah [1]	1	3			3	27	0	0
Pacific States:								
Washington				1	347	283	0	0
Oregon [4]	1	1	10	21	114	31	4	0
California [3]	23	16	31	26	1,451	879	4	1
Total	414	488	492	465	23,419	21,273	101	33
First 23 weeks of year	14,321	16,513	101,131	45,704	621,885	604,158	3,303	1,260

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 8, 1935	Week ended June 9, 1934	Week ended June 8, 1935	Week ended June 9, 1934	Week ended June 8, 1935	Week ended June 9, 1934	Week ended June 8, 1935	Week ended June 9, 1934
New England States:								
Maine	0	0	16	16	0	0	2	8
New Hampshire	3	0	9	2	0	0	0	1
Vermont	0	0	1	16	0	0	0	0
Massachusetts	0	1	197	179	0	0	2	2
Rhode Island	0	0	8	8	0	0	1	1
Connecticut	0	0	64	31	0	0	2	0
Middle Atlantic States:								
New York	8	3	903	616	0	0	11	10
New Jersey	2	0	165	146	0	0	5	10
Pennsylvania	2	0	573	496	0	0	11	11
East North Central States:								
Ohio	1	0	406	416	0	1	8	7
Indiana	1	0	55	71	1	2	3	9
Illinois	1	2	601	415	5	0	9	8
Michigan	0	2	212	438	0	2	7	10
Wisconsin	0	0	435	217	14	15	3	3
West North Central States:								
Minnesota	1	0	214	66	8	4	8	0
Iowa	0	0	86	39	2	1	0	0
Missouri	1	0	45	40	1	0	7	17
North Dakota	0	0	48	14	0	1	0	0
South Dakota [3]	0	0	12	2	3	0	0	0
Nebraska	0	0	44	21	42	1	3	1
Kansas	1	0	45	20	31	1	2	7
South Atlantic States:								
Delaware	0	0	7	2	0	0	1	1
Maryland [2] [3]	1	0	66	31	0	0	1	3
District of Columbia	0	0	23	7	0	0	0	0
Virginia [3]	1	0	28	14	0	1	12	8
West Virginia	1	0	36	64	0	0	9	10
North Carolina [3]	17	0	9	11	2	0	11	1
South Carolina [4]	0	0		2	0	0	24	9
Georgia [4]	0	4	5	1	0	1	23	24
Florida [4]	1	0	5	1	0	0	3	1
East South Central States:								
Kentucky	0	2	24	37	0	1	10	14
Tennessee	0	0	18	8	0	0	14	4
Alabama [4]	1	0	5	4	1	1	16	6
Mississippi [3]	0	2	6	5	1	0	8	6

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 8, 1935, and June 9, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 8, 1935	Week ended June 9, 1934	Week ended June 8, 1935	Week ended June 9, 1934	Week ended June 8, 1935	Week ended June 9, 1934	Week ended June 8, 1935	Week ended June 9, 1934
West South Central States:								
Arkansas	1	0		2	0	0	3	3
Louisiana	2	0	4	8	0	0	12	11
Oklahoma [5]	0	0	7	6	2	1	3	4
Texas [4]	3	1	50	33	11	28	34	31
Mountain States:								
Montana [4]	0	0	11	6	1	0	0	1
Idaho [4]	0	0	2	6	1	0	0	0
Wyoming [2,4]	0	0	21	1	16	8	0	0
Colorado	0	2	131	10	4	5	1	2
New Mexico	0	0	15	4	0	0	4	3
Arizona	0	1	18	7	0	0	2	5
Utah [3]	0	0	126	4	0	0	0	0
Pacific States:								
Washington	0	0	41	50	38	4	1	3
Oregon [2]	0	1	22	22	3	0	1	0
California [2]	9	273	164	181	28	7	7	15
Total	53	294	5,385	3,706	215	85	281	272
First 23 weeks of year	618	1,065	160,782	132,546	4,383	3,308	3,392	3,968

[1] New York City only.
[2] Rocky Mountain spotted fever, week ended June 8, 1935, 30 cases, as follows: South Dakota, 1; Maryland, 2; Virginia, 1; North Carolina, 2; Montana, 4; Idaho, 2; Wyoming, 9; Oregon, 8; California, 1.
[3] Week ended earlier than Saturday.
[4] Typhus fever, week ended June 8, 1935, 21 cases, as follows: South Carolina, 1; Georgia, 12; Florida, 1; Alabama, 6; Texas, 1.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
April 1935										
Mississippi	1	27	3,488	3,924	641	328		21	1	11
May 1935										
Arkansas	2	13	76	233	278	38	4	11	11	12
Connecticut	2	11	7	1	5,380		1	470	0	5
Delaware		6	2		51		0	36	0	1
District of Columbia	39	62	1		250	1	0	216	0	1
Indiana	13	66	47		1,089		0	451	3	14
Missouri	49	116	227	26	2,125	2	1	241	15	18
Nebraska	8	17	13		1,003		1	247	119	1
New Mexico	4	17	26	2	126	6	0	41	7	13
Vermont		1			358		1	36	0	3

April 1935

	Cases
Mississippi:	
Chicken pox	[illegible]96
Dysentery (amoebic)	[illegible]
Hookworm disease	273
Mumps	9[illegible]0
Puerperal septicemia	[illegible]
Rabies in animals	7
Trachoma	1
Tularaemia	1
Undulant fever	3
Whooping cough	511

May 1935

	Cases
Actinomycosis:	
Connecticut	1
Anthrax:	
Delaware	2
Chicken pox:	
Arkansas	37
Connecticut	590
Delaware	37
District of Columbia	13[illegible]
Indiana	37[illegible]
Missouri	[illegible]
Nebraska	112
New Mexico	55
Vermont	10[illegible]
Conjunctivitis:	
Connecticut	4[illegible]
New Mexico	1
Dysentery:	
Connecticut (bacillary)	4
Missouri	11
New Mexico	3
Epidemic encephalitis:	
Arkansas	1
Connecticut	3
District of Columbia	[illegible]
Missouri	[illegible]
Food poisoning:	
New Mexico	6
German measles:	
Connecticut	1,[illegible]
Delaware	[illegible]
New Mexico	[illegible]
Vermont	[illegible]
Mumps:	
Arkansas	65
Connecticut	[illegible]0
Delaware	93
Indiana	1[illegible]2
Missouri	161
Nebraska	18
New Mexico	115
Vermont	11
Ophthalmia neonatorum:	
Missouri	1
New Mexico	4
Paratyphoid fever:	
Connecticut	3
Puerperal septicemia:	
New Mexico	4
Rabies in animals:	
Connecticut	[illegible]
Indiana	[illegible]
Missouri	11
New Mexico	2

May 1935—Contd.

	Cases
Rocky Mountain spotted fever:	
District of Columbia	1
Septic sore throat:	
Connecticut	26
Missouri	78
Nebraska	1
New Mexico	6
Trachoma:	
Arkansas	3
Missouri	96
Undulant fever:	
Arkansas	3
Connecticut	2
Delaware	1
District of Columbia	1
Indiana	5
Missouri	10
Vermont	3
Whooping cough:	
Arkansas	[illegible]2
Connecticut	[illegible]
Delaware	7
District of Columbia	13
Indiana	[illegible]
Missouri	[illegible]
Nebraska	16
New Mexico	110
Vermont	108

PLAGUE-INFECTED RODENTS IN MODOC AND SAN LUIS OBISPO COUNTIES, CALIF.

The Director of Public Health of California has reported positive findings for plague in 28 ground squirrels and 1 field mouse found in Modoc County, Calif., and received at the laboratory on May 11, 21, 29, and 31, and June 3, and in 1 wood rat received at the laboratory on May 24 from a ranch 5 miles north of San Luis Obispo, San Luis Obispo County. Three of the rodents found in Modoc County were from ranches 11 to 12 miles west and 1 miles south of Alturas, and the others were found 1 to 2 miles west and northwest of Alturas.

WEEKLY REPORTS FROM CITIES

City reports for week ended June 1, 1935

This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria, cases	Influenza		Measles, cases	Pneumonia, deaths	Scarlet fever, cases	Smallpox, cases	Tuberculosis, deaths	Typhoid fever, cases	Whooping cough, cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0	------	0	0	0	3	0	0	0	4	24
New Hampshire											
Concord	0	------	0	0	0	1	0	0	0	0	11
Nashua	0	------	------	0	------	0	0	------	0	0	------
Vermont											
Barre	------	------	------	------	------	------	------	------	------	------	
Burlington	0	------	0	2	0	1	0	0	0	0	20
Massachusetts											
Boston	1	------	1	53	20	37	0	15	0	16	243
Fall River	0	------	0	2	0	12	0	1	0	2	19
Springfield	0	------	0	0	2	16	0	0	1	4	34
Worcester	0	------	0	6	4	0	0	2	1	3	48

City reports for week ended June 1, 1935—Continued

State and city	Diphtheria, cases	Influenza		Measles, cases	Pneumonia, deaths	Scarlet fever, cases	Smallpox, cases	Tuberculosis, deaths	Typhoid fever, cases	Whooping cough, cases	Deaths all causes
		Cases	Deaths								
Rhode Island:											
Pawtucket	0	------	0	5	0	0	0	0	0	0	16
Providence	0	------	0	355	5	10	0	2	0	9	50
Connecticut:											
Bridgeport	0	1	1	22	2	9	0	2	0	2	25
Hartford	0	------	0	9	7	4	0	1	0	13	54
New Haven	0	------	0	104	4	1	0	1	0	4	40
New York:											
Buffalo	0	------	0	17	17	58	0	11	0	30	145
New York	23	4	3	1,322	154	537	0	92	4	150	1,612
Rochester	0	------	0	59	8	13	0	1	3	20	72
Syracuse	0	------	0	444	1	24	0	3	0	28	53
New Jersey:											
Camden	1	------	0	1	3	7	0	2	0	5	37
Newark	0	4	0	451	9	12	0	6	0	45	98
Trenton	0	------	0	3	2	8	0	2	0	0	34
Pennsylvania:											
Philadelphia	3	------	0	76	20	120	0	25	3	75	424
Pittsburgh	1	3	1	196	29	43	0	11	0	26	186
Reading	0	------	0	115	2	7	0	0	0	6	40
Scranton	0	------	------	2	------	0	0	------	0	0	------
Ohio:											
Cincinnati	1	------	0	10	11	16	0	6	2	2	123
Cleveland	1	22	2	318	12	39	0	8	0	25	193
Columbus	0	2	2	71	7	24	0	2	0	1	118
Toledo	0	2	1	89	5	18	0	3	0	10	75
Indiana:											
Fort Wayne	7	------	0	1	3	0	0	1	0	1	34
Indianapolis	0	------	0	73	13	12	0	9	0	8	112
South Bend	0	------	0	0	1	6	0	0	0	1	16
Terre Haute	0	------	0	2	0	0	0	0	0	0	35
Illinois:											
Chicago	23	2	2	679	48	577	0	38	4	72	729
Springfield	0	7	0	0	1	4	0	0	0	3	13
Michigan:											
Detroit	1	1	0	624	36	92	0	27	1	67	276
Flint	2	------	0	2	6	8	0	1	0	0	20
Grand Rapids	0	------	1	118	1	18	0	1	0	14	34
Wisconsin:											
Kenosha	0	------	0	3	2	13	0	0	0	2	14
Milwaukee	0	------	0	317	6	78	0	8	0	19	106
Racine	0	------	0	151	0	27	0	0	0	6	10
Superior	0	------	0	0	0	0	0	0	0	0	21
Minnesota:											
Duluth	0	-	0	12	1	0	0	0	0	0	17
Minneapolis	7		2	20	8	83	0	2	2	14	94
St. Paul	0		0	8	7	48	8	0	1	4	68
Iowa:											
Davenport	0		------	0	------	1	0	------	0	0	------
Des Moines	1	------	0	48	0	3	0	0	0	0	43
Sioux City	0	------	0	5	0	1	0	0	0	5	1
Waterloo	0	------	------	1	------	4	0	------	0	3	------
Missouri:											
Kansas City	1	------	1	18	7	14	0	4	0	3	82
St. Joseph	0		0	4	5	4	0	1	0	1	25
St. Louis	7	------	0	25	5	14	0	13	0	5	181
North Dakota:											
Fargo	0	------	0	1	1	18	0	0	0	0	8
Grand Forks	0	------	------	1	------	0	0	------	0	1	------
South Dakota:											
Aberdeen	0	------	------	3	------	0	0	------	0	1	------
Nebraska:											
Omaha	14	------	0	47	7	3	1	4	0	1	63
Kansas:											
Topeka	------	------	------	------	------	------	------	------	------	------	------
Wichita	0	------	0	26	1	1	0	0	0	0	20
Delaware:											
Wilmington	2	------	0	4	0	6	0	0	0	0	22
Maryland:											
Baltimore	1	1	1	23	18	30	0	9	0	21	211
Cumberland	0	------	------	0	------	1	0	0	0	0	11
Frederick	0	------	0	9	0	0	0	0	0	0	5
District of Col.:											
Washington	13	1	1	28	16	31	0	17	0	2	181

City reports for week ended June 1, 1935—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Virginia:											
Lynchburg	0		0	[illegible]	[illegible]	1	0	0	0	0	13
Norfolk	0		0	10	3	3	0		1	[illegible]	11
Richmond	0		0	40	3	1	0	[illegible]	1	0	[illegible]
Roanoke	1		0	[illegible]	1	1	0	0	0	0	11
West Virginia:											
Charleston	1		0		0	0	0	4	0	0	[illegible]
Huntington	0			[illegible]		[illegible]	0		0	0	
Wheeling	0		0	18	5	3	0	0	0	3	[illegible]
North Carolina:											
Raleigh	0	--	0	0	0	0	0	1	0	0	9
Wilmington	0		0	2	1	0	0	0	0	[illegible]	3
Winston-Salem	1		0	0	1	0	0	1	0	[illegible]	[illegible]
South Carolina:											
Charleston	0	[illegible]	0	0	0	0	0	1	[illegible]	0	18
Columbia											
Greenville	0		0	0	1	0	0	0	0	1	7
Georgia:											
Atlanta	0	3	0	1	[illegible]	[illegible]	0	[illegible]	0	12	[illegible]
Brunswick	0		0	0	0	0	0	0	0	0	1
Savannah	1		0	0	0	0	0				[illegible]
Florida:											
Miami	0		0	[illegible]	[illegible]	1	0		0		[illegible]
Tampa	1		0	9		1	0	1	0	1	1
Kentucky:											
Ashland											
Lexington	0		0	10	3	1	0		1		[illegible]
Louisville	0	2	0	51	[illegible]	11	[illegible]	1	[illegible]	11	[illegible]
Tennessee:											
Memphis	0		0	1	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]
Nashville	0		0	1	[illegible]	[illegible]	0	1	1		11
Alabama:											
Birmingham	1	2	0	2	[illegible]		0	[illegible]	1	[illegible]	[illegible]
Mobile	0		2	2	0	0	[illegible]	1	0	0	13
Montgomery	1			0		0	0		[illegible]	0	
Arkansas:											
Fort Smith	0			0		0	0		0	1	
Little Rock	0		0	13	3	0	0	0	0	[illegible]	3
Louisiana:											
New Orleans	6	2	4	28	8	[illegible]	0	10	0		[illegible]
Shreveport	0		0	1	4	0	0	0	0	1	11
Oklahoma:											
Tulsa	0			0		1	0		0	1	
Texas:											
Dallas	2		0	0	6	7	1	3	0	1	[illegible]
Fort Worth	1		0	0	3	1	0	[illegible]	1	0	43
Galveston	0		0	0	0	1	0	0	0	0	[illegible]
Houston	3		0	[illegible]	7	2	0	0	0	0	[illegible]
San Antonio	1		0	0	1	[illegible]	0	[illegible]	0	0	68
Montana:											
Billings											
Great Falls	0		0	3	0	1	0	0	1	10	8
Helena	0		0	2	0	0	0	0	0	1	2
Missoula	0		0	0	3	0	0	0	0	0	10
Idaho:											
Boise	0		0	2	0	1	0	0	0	0	8
Colorado:											
Denver	2		0	176	3	48	0	3	0	0	81
Pueblo	0		0	21	3	3	0	0	0	0	11
Arizona:											
Utah:											
Salt Lake City	0		1	2	1	103	0	0	0	60	22
Nevada:											
Reno	0		0	1	0	0	0	0	0	0	1
Washington:											
Seattle	0			254		21	2	[illegible]	0	4	
Spokane	0		0	33	7	7	0	1	0	3	30
Tacoma	0		0	1	0	2	1	0	0	0	20
Oregon:											
Portland	0		0	76	2	7	0	1	0	0	50
Salem	0			1		3	0		0	0	
California:											
Los Angeles	12	16	0	79	9	65	1	25	0	8	266
Sacramento	0		0	173	2	11	1	2	0	1	32
San Francisco	0		3	68	7	26	0	10	0	41	163

City reports for week ended June 1, 1935—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths	
Massachusetts:			
Boston	2	0	1
Springfield	1	1	0
Worcester	1	0	0
Rhode Island:			
Providence	2	0	0
New York:			
New York	21	14	1
New Jersey:			
Newark	3	1	0
Pennsylvania:			
Philadelphia	2	1	0
Pittsburgh	1	1	0
Ohio:			
Cincinnati	9	5	0
Illinois:			
Chicago	9	3	0
Springfield	3	0	0
Michigan:			
Detroit	1	1	0
Minnesota:			
Minneapolis	1	0	0
Iowa:			
Sioux City	1	1	0
Missouri:			
Kansas City	3	2	0
St. Louis	1	0	0
Nebraska:			
Omaha	0	1	0
Maryland:			
Baltimore	5	1	0
District of Columbia:			
Washington	6	4	0
Virginia:			
Norfolk	3	0	0
West Virginia:			
Wheeling	0	0	1
Kentucky:			
Louisville	3	0	0
Tennessee:			
Nashville	2	1	0
Louisiana:			
New Orleans	1	0	0
Oklahoma:			
Tulsa	1	0	0
Texas:			
Dallas	0	0	1
San Antonio	0	0	1
Nevada:			
Reno	1	0	0
Washington:			
Seattle	1	0	0
Oregon:			
Portland	3	1	0
California:			
Los Angeles	3	3	1
Sacramento	2	0	0

Dengue.—Miami, 1 case.
Epidemic encephalitis.—Cases: New York, 1; Trenton, 1; Atlanta, 1.
Pellagra.—Cases: Winston-Salem, 1; Charleston, S. C., 2; Miami, 1; Tampa, 1; New Orleans, 3; Dallas, 1.
Typhus fever.—Cases: Providence, 1; Tampa, 1.

FOREIGN AND INSULAR

CEYLON

Malaria.—According to a report dated April 29, 1935, there was a recrudescence of the malaria epidemic in many districts of Ceylon. The increase was said to be taking place on a much smaller scale than in November and December 1934, and the disease was of milder type. Mortality figures were given for the four quarters of 1934 and the first quarter of 1935, showing the great increase in the number of deaths (all causes), as follows:

1934	*Number of deaths*
First quarter	30,610
Second quarter	26,641
Third quarter	27,983
Fourth quarter	41,836
1935	
First quarter	81,873

LITHUANIA

Vital statistics 1933.—The following vital statistics for Lithuania for 1933 have been published by the Lithuanian Department of Public Health:

	Number	Rates per 10,000 inhabitants		Number	Rates per 10,000 inhabitants
Population	2,421,700		Deaths from—Continued.	450	1.85
Marriages	19,511	[1]8.1	Scarlet fever	16	.06
Births	62,145	[1]25.7	Syphilis	2,195	9.06
Deaths	32,719	[1]13.5	Tuberculosis (respiratory)	250	1.03
Deaths from—			Tuberculosis (other forms)	171	.70
Diphtheria	311	1.28	Typhoid fever	20	.08
Influenza	487	2.01	Typhus fever	20	.08
Measles	135	.56	Whooping cough		

[1] Per 1,000 inhabitants.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for May 31, 1935, pp. 719–763. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued June 28, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

China—Swatow.—During the week ended May 18, 1935, 1 case of cholera was reported at Swatow, China.

Indo-China—Cochin-China—Bienhoa Province.—On June 2, 1935, 1 case of cholera was reported in Bienhoa Province, Cochin-China, Indo-China.

Plague

China—Amoy.—During the week ended May 11, 1935, 1 imported case of plague was reported at Amoy, China.

United States—California.—A report of plague-infected rodents in Modoc and San Luis Obispo Counties, Calif., appears on page 848 of this issue of PUBLIC HEALTH REPORTS.

Smallpox

Colombia.—During the week ended May 4, 1935, 1 case of smallpox was reported at Barranquilla, and 1 case of smallpox at Bogota, Colombia.

Japan—Mizuna Migifu Prefecture.—According to a report dated June 8, 1935, smallpox had broken out at Mizuna Migifu Prefecture, Japan. The number of cases and deaths is unobtainable. The port of Nagoya is unaffected.

Yellow Fever

Brazil.—During the week ended June 1, 1935, 4 cases of yellow fever were reported in Goyaz State, and 6 cases of the same disease in Minas Geraes State, Brazil.

Colombia—Intendencia of Meta—Restrepo.—During the week ended May 11, 1935, 1 case of yellow fever was reported at Restrepo, Intendencia of Meta, Colombia.

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UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst. Surg. Gen. R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

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PUBLIC HEALTH REPORTS

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LEPROSY

The Effect of a Vitamin B_1 Deficient Diet on the Incubation Period of Rat Leprosy

By L. F. BADGER, *Surgeon*, and W. H. SEBRELL, *Passed Assistant Surgeon, United States Public Health Service*

We have been unable to find any reports in the literature of experimental work on the possible relationship between vitamin B_1 deficiency and rat leprosy. Muir and Henderson (*1*), in 1928, reported the results of studies on the virulence of rat leprosy in rats fed diets deficient in vitamin A and vitamin B. They did not separate vitamin B_1 from vitamin B_2 (G). They reported their results from two experiments in which the rats were fed diets deficient in the vitamin B complex. In one experiment the leprous material was inoculated subcutaneously into 5 rats and in the other intraperitoneally into 4 rats. In their report, the results of the experiments with diets rich in protein decomposition products were combined with the results with vitamin A and vitamin B deficient diets so that no analysis of the results with the vitamin B deficient diet alone can be made.

Lamb (*2*) in 1935 published a paper on the effect of malnutrition on rat leprosy. He also conducted his experiments with a diet deficient in the vitamin B complex, and not with diets deficient in vitamin B_1 and B_2 separately. He inoculated the leprous material, both subcutaneously and intravascularly, into rats fed on diets deficient in the vitamin B complex.

Relative to the intravascular injection, the author states: "It is quite evident * * * that the deficient diets allowed, in most cases, a very marked increase in the development of lesions." And relative to the subcutaneous injection, he states: "In the case of the animals on diets deficient in vitamin B complex, the usual type of lesion was a smaller, less actively growing granuloma with a tendency toward fibrosis and healing, while in the control rats the lesion was a 'normal', spreading type." Further, "Subcutaneous inoculation of rat leproma in a large number of rats on many kinds of dietary deficiencies yielded generally negative results."

With rats fed on a starchy diet plus taro-root and fish, and inoculated subcutaneously, Lamb obtained results which suggested increased susceptibility to rat leprosy. He also found that diets deficient

in the vitamin B complex and somewhat low in protein produced an extensive increase in visceral lesions of rat leprosy in rats inoculated intravascularly.

EXPERIMENTS WITH RATS FED ON A VITAMIN B_1 DEFICIENT DIET

The composition of the vitamin B_1 deficient diet was as follows:

Articles of diet	Percent
Casein (purified) [1]	18
Wesson oil [2]	3
Cod-liver oil	2
Salt mixture [3]	4
Autoclaved yeast [4]	15
Corn starch	58

[1] The casein is first leached in daily changes of acidulated water according to McCollum's method (Bull. Johns Hopkins Hospital, vol. 33, p. 398) and is then baked in an electric oven at 140°–142° C. for 24 hours. About 10 pounds are then packed in a metal percolator, wet with ether, and allowed to stand overnight. The following morning the ether is allowed to drip, fresh ether is added in the afternoon, and the process repeated for 3 days, or until the percolate is clear. The casein is then removed, air dried, repacked in the percolator with 95-percent alcohol, and allowed to drip after standing overnight. This is repeated 3 times. At the end of the third day fresh alcohol is added, and allowed to drip overnight. The casein is then removed and air dried.

[2] A commercial vegetable oil, presumably cottonseed oil.

[3] The salt mixture is prepared according to Osborne and Mendel, J. Biol. Chem., 1919, vol. 37, p. 572.

[4] Pure dried brewer's yeast autoclaved for 2½ hours at 15 pounds pressure.

The control diet was prepared as follows:

Articles of diet	Percent
Whole wheat flour	50.0
Skim milk powder	34.4
Sodium chloride	1.0
Cornmeal (yellow)	12.5
Calcium carbonate	2.0
Cod-liver oil	0.1

Method of handling the rats.—Lots of 5 to 10 rats were placed in metal cages with wire-mesh bottoms. The rats had access to food and water at all times. Our aim was to keep the rats so depleted that they failed to gain in weight, or at the most gained very slowly, but not sufficiently depleted to cause polyneuritis or death.

In the first experiments many of the rats died. In the later experiments the rats were weighed frequently, at times daily, and those rats which showed a marked loss of weight or symptoms of polyneuritis were given small doses of yeast until they gained slightly in weight. In this way we were able to keep most of the rats alive for a considerable length of time. In experiment IV we were able to keep 38 of 40 depleted rats alive for a period of 8 weeks. Depleted rats have been kept alive for 7 months, during which time they have gained but 50 percent of their original weight while the controls have gained as much as 450 percent.

Material.—The source of the strain of rat leprosy used in these experiments was from two wild rats trapped in Jacksonville, Fla.[1]

[1] Received through the courtesy of Dr. R. S. Wynn.

The first rat was received on March 3, and the second on May 7, 1934. Subcutaneous lepromata were removed from the rats, emulsified, and injected into white rats. Strains of rat leprosy were thus established.

Inoculum.—The method of preparing the inoculum in each experiment has been the same. The lepromata have been removed aseptically, slightly macerated, and placed in a saturated solution of sodium carbonate. While in the carbonate solution they have been kept at 37° C. for 2½ to 3 hours, after which the carbonate has been washed off, the material ground with sterile sand, and emulsified in normal saline. The emulsion has then been filtered through 2 or 3 thicknesses of fine-mesh gauze, and inoculated.

Method of inoculation and dosage.—In order to detect the lesions and satisfactorily follow their development in the living rat, all inoculations were made subcutaneously into the lower left abdominal segment. The material was inoculated alternately into control and test rats to assure as uniform doses as possible. In the one experiment in which large rats were used, the amount of the inoculum injected was 0.5 cc, but in the remainder of the experiments, in which small, young rats were used, 0.25 cc of the inoculum was injected.

Lesions produced. The lesion is first noted as a minute, hard, palpable kernel at the site of inoculation. These small, hard lesions gradually increase in size but remain circumscribed for some time. They later become less circumscribed and more diffuse and have the character of spreading lesions. In some of the animals kept alive for a sufficient length of time the lepromata increase in size to such an extent that they cover the entire abdomen. After 5 months a few of the lesions have broken down, and in some the infection has become generalized, as shown by the finding of typical granulomata in the spleen and cervical lymph glands.

Pathology (By Passed Assistant Surgeon J. G. Pasternack). The earliest lesions were confined to the subcutis. They consisted of pale, polygonal, and polyhedral cell formations which were assembled in round or elongated groups and cords or formed discrete and fused small nodular granulomata. The cells have small, round leptochromatic nuclei and an ample zone of pale meshed or vacuolated cytoplasm, hence the designation "foam cells." The surrounding connective tissue shows minor grades of fibroblast proliferation, edema, and lymphocyte infiltration.

The older lesions are very extensive, usually occupy the entire hypoderm, and involve more or less of the underlying muscle tissue.

The tissue reaction may take one of two forms. The one type shows sheets of foam cells more or less subdivided into bulky lobules entirely replacing the hypoderm. These continuous masses are entirely avascular, do not undergo necrotic changes, and show no inflammatory reaction in their vicinity.

The second type consists of discrete miliary and bulky conglomerate granulomata of elongated and compressed foam cells. The conglomerate granulomata frequently show central caseous necrosis. Multinucleated giant cells in small numbers are frequently present. The granulomata are avascular, but the connective tissue of the hypoderm shows capillary vascularization, fibroblast proliferation and lymphocyte infiltration in and around the granulomata.

In all lesions the foam cells and the giant cells are always packed with acid-fast bacilli. Acid-fast bacilli are not infrequently seen within fibroblasts and histiocytes some distance from the foam-cell formations. Acid-fast bacilli were only rarely seen within nerve bundles and muscle fibers in the site of the lesion.

The lymphnodes in the vicinity of the lesion frequently showed minute concentric granulomata in variable numbers. The epithelioid cells forming these granulomata always contained smaller or larger numbers of acid-fast bacilli.

In the spleens from two of the rats some Malpighian follicles showed one to several minute concentric epithelioid granulomata the cells of which contained small to moderate numbers of acid-fast bacilli. Small lymphnodes embedded in the salivary glands of these animals showed similar miliary granulomata but they were richer in acid-fast bacilli.

Experiment I

On October 24, 1934, 24 white rats, weighing from 147 to 264 grams, were inoculated, subcutaneously, with 0.5 cc of an emulsion of a leproma from a leprous white rat. Of the 24 rats, 18 were placed on the deficient diet and 6 on the control diet. The experimental rats were placed on the diet on the day of inoculation and therefore were not depleted before being inoculated. However, 1 week after inoculation, 9 of the 18 experimental rats were depleted, and 2 weeks after inoculation all were depleted, as indicated by loss of weight or failure to gain.

Palpable lesions were first noted 8 weeks after inoculation. After 8 weeks, 1 (6.6 percent) of the 15 living, after 12 weeks 4 (28.5 percent) of the 14 living, and after 16 weeks 11 (84.6 percent) of the 13 living rats on the deficient diet had palpable lesions, while at the end of the latter period but 1 of the 6 (16.6 percent) rats on the control diet had palpable lesions.

Experiment II

On October 24, 1934, 48 white rats, weighing from 38 to 65 grams, were divided into two groups comparable as to weight. Twenty-four of the rats were placed on the deficient diet on October 24, and 12 on October 31. The 24 rats on the deficient diet and the 12 rats on the control diet were all inoculated, subcutaneously, on November 7,

1934, with 0.25 cc of a leproma from a leprous white rat. At the time of inoculation 22, or 62.8 percent, of 35 rats (1 rat died before the inoculation) on the deficient diet were depleted, as indicated by failure to gain or lose weight.

Palpable lesions were first noted 4 weeks after inoculation. After 4 weeks, 11 (40.7 percent) of the 27 living, after 6 weeks 12 (60.0 percent) of the 20 living, and after 8 weeks 12 (66.6 percent) of the 18 living rats on the deficient diet had palpable lesions, while after 8 weeks but 1 (9.0 percent) of the 11 living rats on the control diet had a palpable lesion.

At the end of 8 weeks the average gain in weight of the living rats on the deficient diet was 14.7 percent, while the average gain of those on the control diet was 159 percent.

Experiment III

In this experiment a larger number of rats was used. One hundred male rats, weighing from 41 to 67 grams, were divided into two groups of comparable weights. On December 11, 1934, 50 were placed on the vitamin B_1 deficient diet and 50 on the control diet. On December 26, 1934, 15 days after being placed on the diet, they were all inoculated, subcutaneously, with 0.25 cc of an emulsion of a leproma of a leprous white rat. At the time of inoculation, 27 (54 percent) of those on the deficient diet were depleted. Palpable lesions in these rats were first noted 3 weeks after inoculation. After 4 weeks, 11 (23.9 percent) of the 46 living, after 6 weeks 13 (38.2 percent) of the 34 living, and after 8 weeks 14 (66.6 percent) of the 21 living rats on the deficient diet had palpable lesions, while after 8 weeks but 5 (13.5 percent) of the 37 living rats on the control diet exhibited palpable lesions.

At the end of 8 weeks the average gain in weight of the living rats on the deficient diet was 39.6 percent, while the average gain of those on the control diet was 248 percent.

Experiment IV

In this experiment 88 rats, weighing from 51 to 88 grams, were divided into two groups of comparable weights. On February 8, 1935, 45 were placed on the deficient diet and 43 on the control diet. On February 26, 1935, after 18 days on the diets, all were inoculated, subcutaneously, with 0.25 cc of an emulsion made from lepromata from two of the depleted rats in experiment II. The lepromata from which the inoculum was made were removed 3 months after they had been first noted. At the time of inoculation 41, or 91.1 percent, of those on the deficient diet were depleted.

Palpable lesions in these rats were first noted 2 weeks after inoculation. After 2 weeks, 4 (8.8 percent) of the 45 living, after 4 weeks 16 (41 percent) of the 39 living, after 6 weeks 23 (60.5 percent) of

the 38 living, and after 8 weeks 33 (86.8 percent) of the 38 living rats on the deficient diet had palpable lesions. Of those on the control diet, after 4 weeks 1 (2.4 percent) of the 41 living, after 6 weeks 7 (17.9 percent) of the 39 living, and after 8 weeks 21 (56.7 percent) of the 37 living rats had palpable lesions. At the end of 8 weeks the average gain of the living rats on the deficient diet was 45.8 percent, while the average gain of those on the control diet was 113.2 percent.

It will be noted that figures and percentages are given only for the rats that were living at the stated intervals. Those which developed palpable lesions but died before the time of any one of the examinations are not included in the figures for the later examinations. This is evident in the third experiment, in which many of the rats died. The figures show that 8 weeks after inoculation 14 (66.6 percent) of the 21 living rats had palpable lesions. During the 8 weeks, 9 of the rats with palpable lesions and 20 rats without palpable lesions died and, therefore, were not included in the final summary of the experiment.

TABLE 1.—*Summary of experiments*

Experiment	Diet	Number of rats	Depleted at time of inoculation: Number	Depleted at time of inoculation: Percent	Amount of inoculum (cc)	2 weeks after inoculation: Number living	2 weeks: With palpable lesions: Number	2 weeks: With palpable lesions: Percent	3 weeks after inoculation: Number living	3 weeks: With palpable lesions: Number	3 weeks: With palpable lesions: Percent	4 weeks after inoculation: Number living	4 weeks: With palpable lesions: Number	4 weeks: With palpable lesions: Percent	6 weeks after inoculation: Number living	6 weeks: With palpable lesions: Number	6 weeks: With palpable lesions: Percent	8 weeks after inoculation: Number living	8 weeks: With palpable lesions: Number	8 weeks: With palpable lesions: Percent
Rat II	Vitamin B_1 deficient	[illegible]	[illegible]	62.5	0.25	31	(*)	------	29	(*)	------	27	11	40.7	20	12	60.0	18	12	66.6
	Control	12	------	------	.25	12	(*)	------	12	(*)	------	12	1	8.3	11	1	9.0	11	1	9.9
Rat III	Vitamin B_1 deficient	[illegible]	[illegible]	54.0	.25	49	0	------	49	8	16.3	46	11	23.9	34	13	38.2	21	14	66.6
	Control	57	------	------	.25	45	0	------	45	1	2.2	42	3	7.1	[illegible]	3	7.8	37	5	13.5
Rat IV	Vitamin B_1 deficient	45	41	91.1	.25	45	4	8.8	40	12	30.0	39	16	41.0	38	23	60.5	38	33	86.8
	Control	42	------	------	.25	42	0	------	41	0	------	41	1	2.4	39	7	17.9	37	21	56.7
Human I	Vitamin B_1 deficient	[illegible]	[illegible]	65.0	.25	11	0	------	19	4	21.0	19	13	68.4	19	14	73.6	19	17	89.4
Human II	Vitamin B_1 deficient	[illegible]	5	42.1	.25	17	0	------	16	2	12.5	16	3	15.7	16	8	50.0	16	10	62.5

* Not examined.

HUMAN LEPROSY

Since there appeared to be a shortening of the incubation period of rat leprosy in rats on the vitamin B_1 deficient diet, it was decided to repeat the experiments with human leprous tissue.

Lepromata were removed from two human cases.[1] Neither of the lesions was very acute. The leproma from the first patient was erythematous and somewhat fibrotic, while that from the second patient was less erythematous and more fibrotic. In these experiments the material was treated and the inoculum prepared in the same manner as that used in the experiments with rat leprosy.

Experiment I

Twenty white rats, weighing from 70 to 156 grams, were placed on the vitamin B_1 deficient diet on February 20, 1935. On March 9, after 17 days on the deficient diet, they were inoculated, subcutaneously, with 0.25 cc of an emulsion of the leproma from the first human case. Thirteen of the rats were depleted at the time of inoculation, and 18 one week later.

No rats on the control diet were inoculated, because none of comparable age and weight were available when the human material was received.

Palpable lesions in the rats on the deficient diet were first noted 3 weeks after the inoculation. After 3 weeks 4 (21.0 percent) of the 19 living, after 4 weeks 13 (68.4 percent) of the 19 living, after 6 weeks 14 (73.6 percent) of the 19 living, and after 8 weeks 17 (89.4 percent) of the 19 living rats had palpable lesions. By the end of 9 weeks all of the living rats had palpable lesions.

The lesions in these rats appeared to be identical, grossly, with those of rat leprosy.

Experiment II

Nineteen white rats, weighing from 87 to 151 grams, were placed on the vitamin B_1 deficient diet on February 27, 1935. On March 9, after 10 days on the deficient diet, they were inoculated, subcutaneously, with 0.25 cc of an emulsion made from a leproma of the second human case. Eight of the rats were depleted at the time of inoculation. No rats on the control diet were inoculated, for the reasons given in experiment I.

Palpable lesions in the rats on the deficient diet were first noted 3 weeks after inoculation. After 3 weeks 2 (12.5 percent) of the 16 living, after 4 weeks 3 (18.7 percent) of the 16 living, after 6 weeks 8 (50.0 percent) of the 16 living, after 8 weeks 10 (62.5 percent) of the 16 living, and after 10 weeks 12 (75.0 percent of the 16 living rats

[1] Obtained through the courtesy of Surg. O. E. Denny, Medical Officer in Charge, U. S. Marine Hospital (National Leprosarium), Carville, La.

had palpable lesions. The lesions in the rats in this experiment appeared to be identical, grossly, with those of the previous experiment and with those of rat leprosy.

In both experiments with the human material the lesions have continued to increase in size up to the present time (11 weeks after inoculation).

We feel that no definite conclusions can be drawn from these experiments with human material. Before we can state that a vitamin B_1 deficient diet makes rats more susceptible to human leprosy, and that a strain of human leprosy has been established in the rat, it will be necessary to carry the human leprosy through several generations of rats.

SUMMARY

Four experiments have been conducted in which white rats on a vitamin B_1 deficient diet and rats on a control diet have been inoculated, subcutaneously, with rat leprosy.

The incubation period of rat leprosy in the rats on the vitamin B_1 deficient diet was appreciably shorter than in the rats on the control diet.

In two experiments, white rats on a vitamin B_1 deficient diet were inoculated, subcutaneously, with human leprous material. Local lesions were produced which have continued to increase in size.

REFERENCES

(1) Muir, E., and Henderson, J. N.: Indian Jour. Med. Res., Vol. 15 (1928), p. 807.
(2) Lamb, Alvin R.: Am. Jour. Hyg., Vol. 21 (1935), p. 438.

RATIFICATION OF THE INTERNATIONAL SANITARY CONVENTION FOR AERIAL NAVIGATION

On June 5, 1935, the United States Senate ratified, with two reservations, the International Sanitary Convention for Aerial Navigation, which was opened for signature at The Hague on April 12, 1933, and signed on behalf of the United States on April 6, 1934. Following is the Senate resolution of ratification, with the reservations:

Resolved (two-thirds of the Senators present concurring therein), That the Senate advise and consent to the ratification of Executive G, Seventy-fourth Congress, first session, the International Sanitary Convention for Aerial Navigation, which was opened for signature at The Hague on April 12, 1933, and was signed on behalf of the United States on April 6, 1934, subject to the following two reservations:

(1) With reference to article 61 no amendments to the convention will be binding on the Government of the United States of America or territory subject to its jurisdiction unless such amendments be accepted by the Government of the United States of America;

(2) The Government of the United States of America reserves the right to decide whether from the standpoint of the measures to be applied a foreign district is to be considered as infected, and to decide what requirements shall be applied under special circumstances to aircraft and personnel arriving at an aerodrome in the United States of America or territory subject to its jurisdiction.

The ratification will have to be deposited with the Government of the Netherlands before the convention is proclaimed by the President. The convention provides that as soon as 10 ratifications have been deposited, the Government of the Netherlands will draw up a procès-verbal and transmit copies to the Governments of the high contracting parties and to the Office International d'Hygiene publique, and the convention shall come into force on the one hundredth and twentieth day after the date of the procès-verbal. Ten ratifications have already been deposited with the Netherlands Government, and the convention will come into effect on August 1, 1935.

DEATHS DURING WEEK ENDED JUNE 8, 1935

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended June 8, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	8,155	8,182
Deaths per 1,000 population, annual basis	11.4	11.4
Deaths under 1 year of age	571	631
Deaths under 1 year of age per 1,000 estimated live births	52	59
Deaths per 1,000 population, annual basis, first 23 weeks of year	12.4	12.3
Data from industrial insurance companies:		
Policies in force	67,830,119	67,790,549
Number of death claims	13,156	13,185
Death claims per 1,000 policies in force, annual rate	10.1	10.1
Death claims per 1,000 policies, first 23 weeks of year, annual rate	10.5	10.8

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended June 15, 1935, and June 16, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 15, 1935, and June 16, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 15, 1935	Week ended June 16, 1934	Week ended June 15, 1935	Week ended June 16, 1934	Week ended June 15, 1935	Week ended June 16, 1934	Week ended June 15, 1935	Week ended June 16, 1934
New England States								
Maine	1			1	200	11	0	0
New Hampshire						37	0	0
Vermont	1				16	30	0	0
Massachusetts	12	6			331	817	1	2
Rhode Island	2	1			4[illegible]2	14	0	0
Connecticut	2	3	1		117	210	0	2
Middle Atlantic States								
New York	31	32		19	2,301	[illegible]	15	5
New Jersey	14	13	2	7	907	182	5	0
Pennsylvania	26	30			1,[illegible]	1,9[illegible]	4	2
East North Central States								
Ohio	31	20	83	17	1,927	1,186	6	4
Indiana	20	11	6	10	120	[illegible]	1	1
Illinois	61	40	34	20	1,0[illegible]	1,827	10	7
Michigan	8	9			2,360	301	2	1
Wisconsin	3	4	26	11	1,071	1,702	0	0
West North Central States								
Minnesota	2	5	2	1	190	117	4	1
Iowa [2]	16	12	7		1[illegible]1	100	4	3
Missouri	13	11	64	10	105	179	6	2
North Dakota	2				34	[illegible]	3	0
South Dakota	2	3			17	98	0	0
Nebraska		7			89	[illegible]	2	0
Kansas	13	10	17	1	371	287	0	2
South Atlantic States								
Delaware	3	2			9	70	1	0
Maryland [2,3]	5	10	2	2	98	688	9	1
District of Columbia	2	8		1	30	27	0	0
Virginia [2]	4	6			183	776	10	1
West Virginia	13	8	26	12	213	118	4	0
North Carolina	7	12	2	13	66	798	5	1
South Carolina	1	3	76	77	18	127	0	0
Georgia [4]	3	4				61	0	0
Florida	6	9	1		9	104	0	0
East South Central States								
Kentucky	2	3	3		179	304	1	0
Tennessee	6	8	5	5	21	153	2	0
Alabama [4]	7	8	30	5	68	333	0	0
Mississippi [4]	5	6					0	1

See footnotes at end of table

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 15, 1935, and June 16, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 15, 1935	Week ended June 16, 1934	Week ended June 15, 1935	Week ended June 16, 1934	Week ended June 15, 1935	Week ended June 16, 1934	Week ended June 15, 1935	Week ended June 16, 1934
West South Central States								
Arkansas	5	2	47	6	35	5	0	0
Louisiana [4]	9	12	15	7	90	121	0	1
Oklahoma [5]		2	10	21	36	59	0	2
Texas [4]	20	46	31	58	[illegible]	[illegible]	4	0
Mountain States:								
Montana [3]		7	21	1	202	37	1	0
Idaho [3]		1			19	5	0	0
Wyoming [3]		1	1		5	76	0	0
Colorado	4	9			238	470	0	1
New Mexico			1	1	7	81	1	0
Arizona	1	1		2	7	10	1	0
Utah [3]		1		4	3	17	0	0
Pacific States:								
Washington		1			365	202	2	0
Oregon [3]	4	3		13	144	40	1	0
California [4]	30	31	30	30	1,007	942	3	1
Total	391	430	470	344	10,498	17,751	108	41
First 24 weeks of year	14,715	16,493	101,610	46,047	641,383	621,909	3,411	1,301

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 15, 1935	Week ended June 16, 1934	Week ended June 15, 1935	Week ended June 16, 1934	Week ended June 15, 1935	Week ended June 16, 1934	Week ended June 15, 1935	Week ended June 16, 1934
New England States								
Maine	0	0	21	17	0	0	1	2
New Hampshire	0	0	2	2	0	0	0	0
Vermont	0	0	2	11	0	0	0	0
Massachusetts	1	1	188	166	0	0	1	2
Rhode Island	0	0	5	10	0	0	0	1
Connecticut	0	0	77	41	0	0	2	1
Middle Atlantic States								
New York	1	8	748	496	0	0	7	13
New Jersey	1	2	162	111	0	0	4	4
Pennsylvania	0	3	373	348	0	0	10	7
East North Central States								
Ohio	1	9	416	300	4	1	9	16
Indiana	1	1	[illegible]	[illegible]	0	1	3	0
Illinois	2	1	[illegible]	[illegible]	2	1	4	15
Michigan	0	0	210	287	0	0	4	10
Wisconsin	1	1	365	223	3	11	0	0
West North Central States								
Minnesota	2	0	220	62	7	2	11	1
Iowa [3]	0	1	51	60	8	0	3	1
Missouri	0	1	28	28	2	8	7	10
North Dakota	0	0	31	4	1	0	0	0
South Dakota	0	1	5	6	7	0	0	0
Nebraska	0	1	9	9	15	4	0	0
Kansas	0	0	45	30	29	7	7	8
South Atlantic States:								
Delaware	0	0	4	3	0	0	0	1
Maryland [3] [4]	0	0	53	26	0	0	8	4
District of Columbia	0	0	26	5	0	0	0	1
Virginia [3]	3	2	20	20	0	0	6	12
West Virginia	0	0	37	44	0	0	7	16
North Carolina	57	2	21	18	1	0	16	4
South Carolina	0	0	1	1	0	0	32	20
Georgia [4]	0	1	5	1	0	0	40	20
Florida	0	0	1	3	0	0	15	1
East South Central States:								
Kentucky	0	0	13	14	0	0	9	20
Tennessee	0	1	8	4	0	2	17	11
Alabama [4]	2	0	5	5	0	0	23	14
Mississippi [3]	1	2	7	5	0	0	9	3

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 15, 1935, and June 16, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 15, 1935	Week ended June 16, 1934	Week ended June 15, 1935	Week ended June 16, 1934	Week ended June 15, 1935	Week ended June 16, 1934	Week ended June 15, 1935	Week ended June 16, 1934
West South Central States:								
Arkansas	0	0	3	1	0	0	8	4
Louisiana[4]	2	0	5	1	0	1	16	[illegible]
Oklahoma[5]	0	0	4		1	3	3	[illegible]
Texas[4]	0	1	8	13	9	[illegible]	19	20
Mountain States:								
Montana	0	1	8	1	2	2	0	0
Idaho	1	2	0		0	[illegible]	0	0
Wyoming	0	0	10	2	2	10	0	1
Colorado	0	0	16	1	2	3	0	4
New Mexico	0	0	6	4	0	3	0	3
Arizona	0	3	25	3	0	0	6	2
Utah[3]	0	0	76	4	0	1	0	0
Pacific States:								
Washington	0	2	36	42	20	3	2	2
Oregon[2]	0	0	15	29	2	2	2	2
California[2]	20	273	155	112	10	7	10	7
Total	101	[illegible]	[illegible]	[illegible]	116	99	321	[illegible]
First 24 weeks of year	719	[illegible]	165,318	135,680	4,520	3,107	3,713	[illegible]

1 New York City only.
2 Rocky Mountain spotted fever, week ended June 15, 1935, 25 cases, as follows: Iowa, 1; Maryland, 8; Virginia, 2; Montana, 5; Idaho, 1; Wyoming, 7; Oregon, 1; California, 2.
3 Week ended earlier than Saturday.
4 Typhus fever, week ended June 15, 1935, 15 cases, as follows: Georgia, 7; Alabama, 6; Louisiana, 1; Texas, 1.
5 Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
March 1935										
Colorado		81			4,019		1	1,343	38	[illegible]
April 1935										
Colorado	7	23			3,105		0	1,112	14	[illegible]
May 1935										
California	43	143	182	10	8,692	18	22	1,498	77	41
Florida	1	16	11	20	160	21	3	14	0	22
Georgia	4	26	138	212	74	53	3	26		53
Iowa	12	40	105		1,088		3	135	21	6
Maine		9	7		117		0	36	0	4
Massachusetts	10	30			1,751	4	3	981	0	16
New Jersey	12	100	42	2	9,107		3	764	0	10
North Carolina	10	53	23		722	80	44	61	1	18
Ohio	66	130	104	2	7,800		1	2,588	0	21
South Carolina	1	46	413	540	83	109	2	17	2	33

March 1935

	Cases
Colorado	
Chicken pox	[illegible]
Impetigo contagiosa	
Mumps	197
Rocky Mountain spotted fever	2
Septic sore throat	3
Vincent's infection	[illegible]
Whooping cough	11[illegible]

April 1935

Colorado	
Chicken pox	371
Impetigo contagiosa	1
Mumps	212
Rocky Mountain spotted fever	[illegible]
Vincent's infection	6
Whooping cough	118

May 1935

Actinomycosis	
California	1
Anthrax	
New Jersey	1
Chicken pox	
California	4 9[illegible]
Florida	10[illegible]
Georgia	132
Iowa	347
Maine	171
Massachusetts	1 120
New Jersey	1 700
North Carolina	413
Ohio	1 771
South Carolina	75
Conjunctivitis	
Georgia	5
Dengue	
Florida	5
Georgia	1
South Carolina	2
Diarrhea and enteritis	
Ohio (under 2 years)	6
South Carolina	[illegible]95
Dysentery	
California (amoebic)	17
California (bacillary)	12
Florida (amoebic)	1
Georgia (amoebic)	2
Georgia (bacillary)	70
Massachusetts (amoebic)	1
Massachusetts (bacillary)	1
New Jersey (bacillary)	1
Epidemic encephalitis	
California	5
Georgia	1
Maine	2

May 1935—Continued

	Cases
Epidemic encephalitis—Continued	
Massachusetts	1
New Jersey	[illegible]
Ohio	[illegible]
South Carolina	1
Food poisoning	
California	
Ohio	[illegible]
German measles	
California	4 5[illegible]
Iowa	[illegible]
Maine	[illegible]31
Massachusetts	9 7[illegible]
New Jersey	3 [illegible]
North Carolina	13[illegible]
Ohio	3 7[illegible]
Granuloma coccidioidal	
California	3
Hookworm disease	
Georgia	47[illegible]
South Carolina	[illegible]
Jaundice, epidemic	
California	1
Lead poisoning	
Massachusetts	1
Ohio	9
Leprosy	
California	2
Mumps	
California	1 800
Florida	[illegible]18
Georgia	14[illegible]
Iowa	1 0[illegible]0
Maine	[illegible]
Massachusetts	[illegible]74
New Jersey	1 01[illegible]
Ohio	1 842
South Carolina	208
Ophthalmia neonatorum	
California	3
Massachusetts	12[illegible]
New Jersey	2
North Carolina	4
Ohio	5
South Carolina	6
Paratyphoid fever	
California	3
New Jersey	1
North Carolina	2
Ohio	1
South Carolina	5
Puerperal septicemia	
Ohio	6
Rabies in animals	
California	120
Maine	[illegible]
Massachusetts	[illegible]
New Jersey	9
South Carolina	[illegible]

May 1935—Continued

	Cases
Rabies in man	
New Jersey	1
Rocky Mountain spotted fever	
California	1
North Carolina	1
Screw-worm infection	
Georgia	1
Septic sore throat	
California	14
Georgia	13
Massachusetts	18
North Carolina	18
Ohio	2[illegible]7
Tetanus	
California	5
Georgia	4
Maine	1
Massachusetts	1
New Jersey	2
Ohio	1
Trachoma	
California	17
Massachusetts	1
Ohio	1
Trichinosis	
California	[illegible]
Maine	2
Tularaemia	
Georgia	4
Ohio	1
South Carolina	1
Typhus fever	
Florida	1
Georgia	19
North Carolina	6
Undulant fever	
California	10
Florida	1
Georgia	5
Iowa	13
Massachusetts	3
New Jersey	3
North Carolina	3
Ohio	3
Vincent's infection	
Maine	1
Whooping cough	
California	1,125
Florida	74
Georgia	153
Iowa	80
Maine	98
Massachusetts	804
New Jersey	1 [illegible]71
North Carolina	1,422
Ohio	[illegible]
South Carolina	193

CASES OF VENEREAL DISEASES REPORTED FOR APRIL 1935

This statement is published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State health officers. They are preliminary and are, therefore, subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

State	Syphilis: Cases reported during month	Syphilis: Monthly case rate per 10,000 population	Gonorrhea: Cases reported during month	Gonorrhea: Monthly case rate per 10,000 population
Alabama	47[illegible]	1.76	91	[illegible]
Arizona	10[illegible]	2.[illegible]	129	2.[illegible]
Arkansas[1]	423	[illegible].26	116	[illegible]8
California	1,[illegible]	2.2[illegible]	1,[illegible]10	2.22
Colorado[2]				
Connecticut	206	1.25	[illegible]	.11
Delaware	1[illegible]	6.[illegible]2	29	1.20
District of Columbia	159	3.21	172	2.67
Florida	199	1.[illegible]	77	[illegible]
Georgia	1,15[illegible]	3.97	358	1.[illegible]
Idaho	0	0	0	0
Illinois	1,171	1.[illegible]8	1,161	1.49
Indiana	269	.82	258	.74
Iowa[1]	116	47	118	60
Kansas	90	17	51	27
Kentucky	219	83	29[illegible]	1.11
Louisiana	272	1.28	127	59
Maine	36	.45	48	60
Maryland	827	4.97	171	1.03
Massachusetts	193	1.15	608	1.18
Michigan	537	1.06	467	.93
Minnesota	369	1.42	303	1.17
Mississippi	1,097	5.36	1,716	8.38
Missouri	251	68	88	21
Montana[1]	59	1.10	46	86
Nebraska	40	.20	69	50
Nevada[3]				
New Hampshire	12	.26	7	.15
New Jersey	656	1.64	302	.72
New Mexico[1]	56	1.26	25	.58
New York	6,117	4.72	1,407	1.13
North Carolina	1,413	4.31	384	1.11
North Dakota	13	19	40	67
Ohio	712	1.05	186	27
Oklahoma[1]	191	92	173	83
Oregon	81	.85	90	.92
Pennsylvania	301	31	215	.22
Rhode Island	76	1.08	40	[illegible]
South Carolina[1]	336	1.92	448	2.56
South Dakota	9	13	19	27
Tennessee	859	3.2[illegible]	434	1.[illegible]
Texas	401	.82	130	22
Utah[3]				
Vermont	12	.33	35	.97
Virginia[1]	342	1.40	257	1.05
Washington	191	1.19	189	1.18
West Virginia[2]				
Wisconsin[4]	31	.12	119	40
Wyoming[3]				
Total	22,343	1.81	12,391	1.03

[1] Incomplete.
[2] Not reporting.
[3] Has been reporting regularly but no report received for current month.
[4] Only cases of syphilis in the infectious stage are reported.

NOTE.—Surveys in which all medical sources have been contacted in representative communities throughout the United States have revealed that the monthly rate per 10,000 population is 6.6 for syphilis and 10.2 for gonorrhea.

WEEKLY REPORTS FROM CITIES

City reports for week ended June 8, 1935

This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Maine:											
Portland	0	------	0	0	2	2	0	0	1	8	23
New Hampshire:											
Concord	0	------	0	0	0	2	0	0	0	0	14
Nashua	0	------	------	0	------	0	0	------	0	0	------
Vermont:											
Barre	------	------	------	------	------	------	------	------	------	------	------
Burlington	0	------	0	3	0	0	0	0	0	0	5
Massachusetts:											
Boston	2	------	0	77	29	40	0	5	0	28	200
Fall River	1	------	0	5	3	6	0	2	0	4	27
Springfield	0	------	0	70	2	12	0	1	0	5	32
Worcester	0	------	0	9	3	13	0	0	1	1	32
Rhode Island:											
Pawtucket	0	------	0	5	0	1	0	0	0	0	16
Providence	1	------	0	401	4	6	0	2	0	19	60
Connecticut:											
Bridgeport	1	------	0	11	1	9	0	2	0	0	30
Hartford	------	------	------	------	------	------	------	------	------	------	------
New Haven	0	------	0	91	1	1	0	1	0	3	30
New York:											
Buffalo	0	------	0	31	15	63	0	8	0	12	127
New York	20	6	5	1,608	145	419	0	86	5	182	1,405
Rochester	0	------	0	33	10	10	0	0	1	21	63
Syracuse	0	------	0	200	4	23	0	1	0	14	44
New Jersey:											
Camden	2	------	1	0	2	4	0	2	0	9	32
Newark	0	2	0	362	3	14	0	4	0	66	72
Trenton	0	------	0	1	4	10	0	3	0	1	45
Pennsylvania:											
Philadelphia	7	4	3	103	35	86	0	23	1	77	537
Pittsburgh	3	2	2	153	24	30	0	8	1	23	104
Reading	0	------	0	158	2	2	0	1	0	0	10
Scranton	0	------	------	15	------	7	0	------	0	2	------
Ohio:											
Cincinnati	2	------	0	9	8	13	0	9	0	6	145
Cleveland	8	11	2	474	16	65	0	17	0	30	183
Columbus	0	------	0	67	4	16	0	6	0	1	88
Toledo	0	1	1	89	8	15	0	5	0	9	77
Indiana:											
Fort Wayne	5	------	0	1	1	3	0	0	0	0	27
Indianapolis	2	------	0	77	11	11	0	2	0	16	94
South Bend	0	------	0	0	0	2	0	0	0	0	
Terre Haute	0	------	0	1	0	0	0	1	0	0	15
Illinois:											
Chicago	25	------	2	741	51	538	0	34	1	97	690
Springfield	0	------	0	7	2	6	1	1	0	4	22
Michigan:											
Detroit	8	------	0	583	30	68	0	20	0	114	281
Flint	0	------	0	1	4	0	0	1	0	6	32
Grand Rapids	0	------	0	136	1	16	0	0	0	17	28
Wisconsin:											
Kenosha	0	------	0	8	2	7	0	0	0	5	10
Milwaukee	0	------	0	632	5	76	0	4	0	23	99
Racine	0	------	0	107	1	33	0	0	0	11	11
Superior	0	------	0	26	0	0	0	0	0	1	12
Minnesota:											
Duluth	0	------	0	16	3	1	0	0	0	1	29
Minneapolis	8	------	0	24	8	80	1	1	2	9	98
St. Paul	0	------	0	7	10	37	0	2	3	4	56
Iowa:											
Davenport	0	------	------	1	------	2	0	------	0	0	------
Des Moines	1	------	0	122	0	6	1	0	0	0	39
Sioux City	1	------	------	1	------	2	0	------	0	4	------
Waterloo	0	------	------	0	------	4	0	------	0	1	------
Missouri:											
Kansas City	1	------	0	14	15	10	0	8	0	2	107
St. Joseph	1	------	0	1	0	4	0	0	0	0	4
St. Louis	15	------	0	12	6	20	0	6	0	8	178

City reports for week ended June 8, 1935—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
North Dakota:											
Fargo	0		0	0	0	0	0	0	0	0	10
Grand Forks	0			0		0	0		0	0	
South Dakota:											
Aberdeen	0		0	0		0	0		0	3	
Nebraska:											
Omaha	4		0	38	6	4	2	3	0	0	57
Kansas:											
Topeka											
Wichita	0		0	8	4	0	0	1	0	0	30
Delaware:											
Wilmington	2		0	6	3	5	0	1	1	2	24
Maryland:											
Baltimore	4		0	39	19	33	0	10	0	8	190
Cumberland	0		0	1	0	1	0	0	0	0	7
Frederick	0		0	1	0	0	0	0	0	0	3
District of Col.:											
Washington	7		0	34	14	23	0	13	1	4	172
Virginia:											
Lynchburg	0		0	0	3	0	0	0	0	32	12
Norfolk	0		0	3	2	1	0	4	1	0	32
Richmond	0		0	18	2	0	0	0	0	2	41
Roanoke	0		1	6	1	1	0	0	0	1	17
West Virginia:											
Charleston	0		0	11	1	1	0	0	0	2	8
Huntington	0			3		2	0		0	0	
Wheeling	0		0	38	1	0	0	0	0	1	19
North Carolina:											
Raleigh	0		0	0	0	0	0	0	0	0	10
Wilmington	0		0	0	0	0	0	0	2	4	9
Winston-Salem	1		0	0	1	0	0	2	0	11	15
South Carolina:											
Charleston	0		0	0	4	0	0	0	0	0	21
Columbia											
Greenville	0		0	0	1	0	0	0	0	0	8
Georgia:											
Atlanta	2	3	1	1	3	3	0	8	3	12	81
Brunswick	0		0	0	0	0	0	0	0	0	4
Savannah	0		0	0	2	0	0	5	0	0	30
Florida:											
Miami	1		0	3	1	3	0	4	0	2	22
Tampa	0		0	6	2	0	0	4	12	3	26
Kentucky:											
Ashland	0			3		0	0		0	0	
Lexington	0		0	10	2	1	0	2	0	2	17
Tennessee:											
Memphis	1		0	1	3	4	0	10	0	1	103
Nashville	0		0	0	2	2	0	2	0	1	63
Alabama:											
Birmingham	0	1	0	10	2	2	0	1	5	6	53
Mobile	0		0	2	2	1	0	0	0	0	18
Montgomery	1			0		0	0		0	3	
Arkansas:											
Fort Smith	0			0		0	0		0	8	
Little Rock											
Louisiana:											
New Orleans	5	1	0	13	9	4	0	20	1	1	151
Shreveport	0		0	0	3	0	0	1	1	0	24
Oklahoma:											
Oklahoma City	0	5	1	7	2	1	0	2	0	0	41
Texas:											
Dallas	3		0	1	0	2	0	3	0	0	50
Fort Worth	0		0	0	0	0	0	0	0	0	24
Galveston	0		0	0	1	1	0	2	0	0	17
Houston	3		0	2	7	5	1	3	2	3	89
San Antonio	3		0	1	7	4	0	5	0	0	57
Montana:											
Billings	0		0	10	2	1	0	0	0	0	10
Great Falls	0		0	3	3	0	0	0	0	3	8
Helena	0		0	6	1	0	0	0	0	12	6
Missoula	0		0	0	0	0	0	0	0	0	
Idaho:											
Boise	0		0	1	0	0	0	0	0	0	6
Colorado:											
Denver	3		0	134	4	62	0	3	0	1	79
Pueblo	0		0	15	0	5	0	0	0	2	8

City reports for week ended June 8, 1935—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
New Mexico:											
Albuquerque	0		0	4	2	1	0	2	0	4	11
Utah:											
Salt Lake City	1		2	3	4	110	0	3	0	0	34
Nevada:											
Reno	0		0	2	0	1	0	0	0	0	6
Washington:											
Seattle	0		1	242	2	11	2	1	1	0	83
Spokane	0		0	35	2	4	0	1	0	5	29
Tacoma	0		0	2	0	0	5	0	0	0	20
Oregon:											
Portland	0		1	20	3	11	0	4	0	1	80
Salem	0			1		1	0		0	0	
California:											
Los Angeles	10	14	0	87	13	30	8	20	1	11	373
Sacramento	0		0	121	5	17	0	2	0	3	31
San Francisco	1	4	0	157	3	20	0	11	0	58	152

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts:			
Worcester	0	1	0
Rhode Island:			
Providence	2	2	0
New York:			
New York	24	7	2
Pennsylvania:			
Philadelphia	3	0	0
Ohio:			
Cincinnati	1	1	0
Cleveland	2	0	0
Columbus	1	1	0
Toledo	2	2	0
Indiana:			
Indianapolis	1	0	0
Illinois:			
Chicago	14	3	0
Michigan:			
Detroit	1	0	0
Minnesota:			
Minneapolis	1	2	0
Iowa:			
Sioux City	1	0	0
Missouri:			
Kansas City	3	3	0
St. Joseph	1	0	0
St. Louis	3	1	0
Nebraska:			
Omaha	1	0	0
Maryland:			
Baltimore	10	1	0
District of Columbia:			
Washington	10	2	0
Virginia:			
Norfolk	4	2	0
North Carolina:			
Winston-Salem	0	1	0
Florida:			
Miami	1	0	0
Tennessee:			
Memphis	0	2	0
Alabama:			
Birmingham	2	0	0
Louisiana:			
New Orleans	1	0	2
Oklahoma:			
Oklahoma City	1	0	0
Oregon:			
Portland	4	1	0
California:			
Los Angeles	1	2	7
Sacramento	1	0	1
San Francisco	0	1	0

Dengue: Miami, 1 case.

Epidemic encephalitis.—Cases: New York, 1; Philadelphia, 1; Pittsburgh, 2; Detroit, 1; Fargo, 1; Atlanta, 1; New Orleans, 1.

Pellagra.—Cases: Boston, 1; Charleston, S. C., 2; Savannah, 4; New Orleans, 1; Los Angeles, 3; San Francisco, 1.

Rabies in man: Atlanta, 1 death.

Typhus fever.—Cases: Charleston, S. C., 1; Savannah, 1; Tampa, 1; Montgomery, 1; Fort Worth, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended June 1, 1935.—During the 2 weeks ended June 1, 1935, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				2	1					3
Chicken pox		8	2	289	568	45	41	50	159	1,162
Diphtheria		4	2	23	10		5		1	45
Dysentery				4	1					5
Erysipelas				6	6	3			2	17
Influenza			6		22	178			70	276
Measles		55	44	1,110	4,878	175	68	115	182	6,937
Mumps		15	2		412	264	23	38	20	771
Paratyphoid fever		1			1					2
Pneumonia (all forms)		1			24		2		12	39
Poliomyelitis				1	1					2
Scarlet fever		16	3	239	211	27	4	19	63	585
Smallpox					1		1			2
Tuberculosis	6	30	38	91	115	17	51	7	32	387
Typhoid fever			1	38	6	2	2	2	1	52
Undulant fever					6		7			13
Whooping cough			1	107	353	66	91	6	91	715

CUBA

Provinces—Notifiable diseases—4 weeks ended June 1, 1935.—During the 4 weeks ended June 1, 1935, cases of certain notifiable diseases were reported in the Provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	2	3		2	2		9
Chicken pox			1	1			2
Diphtheria			2	4			6
Hookworm disease	1			11			12
Leprosy				1	1	9	11
Malaria	96	5	12	162	70	171	516
Measles	28	5	12	27	2	1	75
Poliomyelitis	1			4			5
Scarlet fever				1			1
Tuberculosis	5	6	21	38	20	43	136
Typhoid fever		10	8	40	44	15	117

ITALY

Communicable diseases—4 weeks ended April 28, 1935.—During the 4 weeks ended April 28, 1935, cases of certain communicable diseases were reported in Italy, as follows:

Disease	Apr. 1-7		Apr. 8-14		Apr. 15-21		Apr. 22-28	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	14	14	11	11	4	4	9	8
Cerebrospinal meningitis	16	11	21	18	21	19	19	18
Chicken pox	[illegible]	[illegible]	412	125	475	132	[illegible]	136
Diphtheria and croup	533	296	558	281	585	261	411	215
Dysentery	1	1	3	3	1	1	2	1
Hookworm disease	24	6	21	8	11	7	12	5
Lethargic encephalitis	5	5	4	4	1	1	3	3
Measles	2,516	[illegible]	2,357	381	3,118	413	2,412	391
Paratyphoid fever	27	24	26	21	25	20	26	21
Poliomyelitis	8	6	9	8	10	9	4	3
Puerperal fever	33	36	47	12	36	34	35	32
Scarlet fever	313	171	331	113	315	127	318	121
Typhoid fever	147	103	158	111	158	9	112	93
Undulant fever	87	62	83	76	61	43	57	38
Whooping cough	283	92	203	95	289	93	281	90

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following table must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths, P, present]

Place		Oct. 25–Nov. 24, 1934	Nov. 25–Dec. 26, 1934	Dec. 30, 1934–Jan. 26, 1935	Jan. 27–Feb. 23, 1935	Week ended— March 1935: 2	9	16	23	30	April 1935: 6	13	20	27	May 1935: 4	11	18	25
Ceylon:																		
Colombo	C				22	4	1											
	D				17	3												
Pellyagoda	C				22													
	D				17													
China:																		
Canton	C																1	
Swatow	C																1	
India	C	16,178	17,579	18,371	14,613	3,370	3,565	2,358	4,557	5,430	5,565	6,019	5,949	5,571				
	D	8,559	5,452	[illegible]	7,6[illegible]	1,719	1,913	2,741	2,2[illegible]	2,563	2,942	3,1[illegible]3	3,[illegible]	2,[illegible]45				
Assam	C	227	645	574	127	47	49	51	87	105	354	437	633	626	[illegible]	[illegible]	[illegible]	[illegible]
	D	133	274	414	82	22	21	25	42	59	157	271	291	416	657	[illegible]	530	403
Bassein	C		25	[illegible]	6	3				1	1	3	2	15	[illegible]	5	2	
	D		[illegible]	9	4	1	1				1	[illegible]	1	9	12	8	2	
Bombay Presidency	C	872	[illegible]	69	151	74	32	22	45	48	31	13	71	51	[illegible]	[illegible]	17	
	D	583	[illegible]	45	59	37	12	17	15	14	11	8	21	15	[illegible]	[illegible]	11	
Bombay	C						6							1				
Calcutta	C	75	[illegible]	174	444	154	156	154	157	157	151	163	206	272	[illegible]	256	[illegible]	163
Chittagong	C	1	12		4	2	3			9	7		9	3	6	6	15	4
Madras Presidency	C	[illegible]	[illegible]	[illegible]	6,473	875	843	626	601	633	818	513	596	305				
	D	555	2,4[illegible]	4,[illegible]15	2,540	473	413	[illegible]	[illegible]	515	403	292	271	249				
Madras	C	53	[illegible]	25	6	1		1	1			1		1				
	D	32	[illegible]	17	3				1									
Porto Novo	C		P															
Mergui	C				2													
Moulmein	C			1	26	4	2		[1] 2			4	[1] 2					1
Negapatam	C	1		12	2	1	2		9	2	3	5		2				
Punjab	C															P	3	2
Rangoon	C		1	2	34		2	3	3	[1] 11	7	3	3	3	1	5	2	3
Tuticorin	C			1						[1] 11	18		14	5	2	4		

[1] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

[C indicates cases; D, deaths; P, present]

Place		Oct. 25–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Dec. 30, 1934–Jan. 26, 1935	Jan. 27–Feb. 23, 1935	Week ended—												
						March 1935					April 1935				May 1935			
						2	9	16	23	30	6	13	20	27	4	11	18	25
India (French):																		
Chandernagor	C					1				16	14	31	10	4				
Karikal	C	2	11	55	28	5	8	2	2				1					
Pondichery	C	10	29	50	27	2		1	4	2	2		1	9				
India (Portuguese)	C		10															
Indo-China (see also table below):																		
Kandal	C			2														
Pnom-Penh	C		2		1					1								
Siam:																		
Bangkok	C						1											
Nagara Rajsima—Roy Ech	C					13												
	D					2												
On vessels:																		
S. S. *Ellenga* at Rangoon from Calcutta	C			1														
S. S. *Tilawa* at Cocanada	C				[1] 1													
S. S. *Egra* at Rangoon	C			[1] 1														
S. S. *Santhia* at Rangoon from Calcutta	C				1													
S. S. *Incomati* at Colombo	C							1										
	D							1										
S. S. *Pasha* at Rangoon from Moulmein	C						1											
S. S. *Khandalla* at Rangoon	C							1										
S. S. *Jana* at Moulmein from Mergui	C							1										
S. S. *Karoa* at Rangoon	C							1										
S. S. *Ethiopia* at Madras from Rangoon	C												1					
	D												1					
S. S. *Ellenga* at Rangoon	C												1					

[1] Suspected.

Place		January 1935			February 1935			March 1935			April 1935			May 1935
		1-10	11-20	21-31	1-10	11-20	21-28	1-10	11-20	21-31	1-10	11-20	21-30	1-10
Indo-China (French) (see also table above):														
Cambodia [3]	C	-------	-------	2	1	3	-------	3	-------	1	1	1	2	17
	D	-------	-------	2	1	3	-------	3	-------	1	1	1	2	12
Cochin-China [3]	C	-------	1	-------	-------	2	-------	2	1	1	1	1	1	3
	D	-------	1	-------	-------	1	-------	2	1	1	1	1	1	2

[3] Reports incomplete.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE [1]

[C indicates cases; D, deaths. P, present]

Place		Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Dec. 30, 1934–Jan. 26, 1935	Jan. 27–Feb. 23, 1935	Week ended— March 1935: 2	9	16	23	30	April 1935: 6	13	20	27	May 1935: 4	11	18	25
Argentina (see also table below):																		
Pampa Territory—Victorica	C																1	
	D																1	
Santiago de Estero Province—Frias	C		1															
Azores. (See table below.)																		
Bechuanaland Protectorate	C																	
Plague-infected rats													1		1			
Belgian Congo	C	14											P					
Bolivia: Tomina Province. (See table below.)				4					1									
Brazil:																		
Alagoas State	C		5															
	D		2															
Ceara State	C		2															
British East Africa (see also table below):																		
Kenya	C	5	4					1		1								
Tanganyika	C									1								
Uganda	C	[illegible]	122	78	50	4	11	2	[illegible]		[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		
	D	75	114	79	49	4	11	2	[illegible]		[illegible]	11	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Canary Islands: Las Palmas	C			1														
Ceylon: Colombo	C	2	1		2	2	2						1			4		
	D	2	1		2	2	2											
Plague-infected rats		3						4			5	5	1	1		1		
China (see also table below):																		
Amoy	C					[5] 1												
Kangping [3]																[illegible]		
Manchuria: Mansantum [4]	D		4															
Dutch East Indies:																		
Cheribon	C				[5] 1													
West Java	C	[illegible]	[illegible]	2,42[illegible]	1,795	[illegible]	371	2[illegible]5	[illegible]									
	D	2,55[illegible]	2,[illegible]00	2,425	1,794	340	371	29[illegible]	[illegible]									
Ecuador (see also table below):																		
Egypt:																		
Alexandria	C															1		
Plague-infected rats		P	P	P	P	P		P		P		P		P		P		

Asyut	C	2				1				2		1		3	11		1	
Beni-Suef	C	1																
Girga	C			1	1					1								1
Hawaii Territory:																		
Hawaii Island—Hamakua district—Plague-infected rats																	1	
Kalopa—Plague-infected rats		3																
Paauhau	C	1							1									
	D	1								1								
Plague-infected rats										2								
Pohakes—Plague-infected rats														1				
Maui Island—Makawao district—Kahului (9-10 miles from)—Plague-infected rats							1	1						1				
India	C	4,167	4,[illegible]	[illegible]	[illegible]	1,713	1,915	1,[illegible]	1,[illegible]	1,[illegible]	2,050	1,271	1,[illegible]	1,291				
	D	2,424	2,[illegible]	[illegible]	3,[illegible]	[illegible]	1,[illegible]	[illegible]	1,[illegible]	1,[illegible]	1,[illegible]	[illegible]	652	1,010				
Bassein	C	3	1		1			2	2	2	5	1	2		1	2	1	
Plague-infected rats							1											
Bombay Presidency	C	2,063	1,[illegible]	1,[illegible]	1,253	209	[illegible]	162	142	[illegible]	111	96	64	[illegible]	45	15	13	
	D	1,109	[illegible]	[illegible]	[illegible]	114	144	122	72	95	55	52	25	[illegible]	15	10	8	
Bombay	C			1														
Madras Presidency	C	229	[illegible]	257	161	25	35	23	12	16	2	2	6	1				
	D	92	[illegible]	115	96	10	[illegible]	14	9	5	3	3	3	1				
Mandalay	C				2													
Moulmein	C						[2]1					1	1			1		
	D						[2]1											
Northwest Frontier Province	C							15										
	D							[illegible]										
Punjab	C	53	[illegible]	32	147	74	57	[illegible]	[illegible]	114	50	[illegible]	165	[illegible]	[illegible]	[illegible]	105	[illegible]
	D	55	43	19	[illegible]	[illegible]	15	83	27	75	18	42	63	109	[illegible]	113	[illegible]	45
Rangoon	C			1	1			1					1					
Plague-infected rats			1					1							1	1		
Indo-China (see also table below):																		
Bentre	C					1												
Kandal	C			1														
Longxuyen.[5]																		
Pnom-Penh	C	1	2														1	
Saigon and Cholon	C	2													1			
Tanghai Island	C											12						
Tayninh.[5]																		
Iraq:																		
Baghdad	C														1	2		
Baghdad Province	C														1			

[1] Including plague in the United States and its possessions.
[2] Imported.
[3] A report dated Jan. 29, 1935, states that up to Jan. [illegible], [illegible] cases of plague with 75 deaths were reported near Kangping, China; the report also states that up to Jan. 21, 70 deaths from plague were reported in 6 villages of the Pe Wang Fu District, northwest of Kangping.
[4] Up to Jan. 5, 1935, 44 cases of plague with 35 deaths were reported at Mansantun, Manchuria, China.
[5] During the week ended June 5, 1935, 1 case of plague was reported at Longxuyen, and 1 case of plague at Tayninh, Indo-China.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Dec. 30, 1934–Jan. 26, 1935	Jan. 27–Feb. 23, 1935	Week ended— March 1935 2	9	16	23	30	April 1935 6	13	20	27	May 1935 4	11	18	25
Madagascar. (See table below.)																		
Morocco:																		
Saffi Region	C									6		7	4	3	1			
	D									5	2	5	2	2	1			
Tangier	C	7																
Peru. (See table below.)																		
Senegal. (See table below.)																		
Siam:																		
Prachin—Nagara Nayok	C		4															
Nagara Rajsima	C				1													
Rajpuri	C			1		1												
South-West Africa. (See table below.)																		
Tunisia: Tunis—Plague-infected rats					1													
Union of South Africa:																		
Cape Province	C			3	3				2				1					
Orange Free State	C	2	3		33				1				1					
Transvaal	C								24									
United States:																		
California—Plague-infected ground squirrels—																		
Modoc County [6]																		[7] 1
San Luis Obispo County																		[8] 1
Oregon—Lake County—Plague-infected ground squirrels																1		1

[6] For the 2 weeks ended June 8, 1935, [illegible] plague-infected ground squirrels were reported in Modoc County, Calif.
[7] Plague-infected mouse.
[8] Plague-infected wood rat.

Place		November 1934	December 1934	January 1935	February 1935	March 1935	April 1935
Argentina (see also table above): Santa Fe	C				1	1	
Azores	C	1	1	2	3		
Bolivia: Tomina Province	C			4	4	4	
British East Africa (see also table above): Kenya	C	6					
China: Kwangchowan	C	3					20
	D	3					13
Ecuador:							
Chimborazo Province	C				4		
Loja Province	C				15	17	6
Indo-China (see also table above):							
Cambodia	D	4	2	1			
Cochin-China	C	2				1	2
Naotchao Island	C					29	18
Madagascar (central region)	C	431	381	[illegible]	491	211	
	D	410	364	[illegible]	472	203	

Place		November 1934	December 1934	January 1935	February 1935	March 1935	April 1935
Peru	C	2	5	5	15	14	13
Libertad Department	C				[illegible]	5	
Lima Department	C	1	1	1	6	5	
Callao	C				3	2	
	D				2	2	
Plague-infected rats					4		
Lima	C			2	3	2	9
	D					1	7
Plague-infected rats				5	5		
Senegal							
Dakar [1]	C	4	2	2	1	2	5
	D	3	2	2	1	2	4
Rufisque [1]	C	4		1			17
Thies [1]	C						3
Tivaouane [1]	C	3	1				5
South-West Africa, Ovamboland	C				[2] 58	29	

[1] Reports incomplete.
[2] For January and February.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Dec. 30, 1934–Jan. 26, 1935	Jan. 27–Feb. 23, 1935	Week ended— March 1935: 2	9	16	23	30	April 1935: 6	13	20	27	May 1935: 4	11	18	25
Algeria: Constantine Department	C				1				2								1	
Belgian Congo (see also table below)	C	102		5														
Bolivia. (See table below.)																		
Brazil:																		
Recife	C		1															
Sergipe State	C	P																
British East Africa:																		
Kenya	C	17	13															
Tanganyika	C	14	63	2	3			15		[illegible]								
Uganda	C																	
British Guiana	C																	
British Somaliland	C	5		8	29	2	2	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]					
British South Africa:																		
Northern Rhodesia	C				25			27										
Southern Rhodesia	C		1															
Canada:																		
Alberta	C	2	1															
Ontario	C				2						[illegible]							
Saskatchewan	C	[illegible]									[illegible]							
Canary Islands: Santa Cruz de Tenerife	C		3															
Ceylon:																		
Colombo	C	[illegible]	12	15	1													1
Galle	C							13	[illegible]									
Welitara	C					11	15	[illegible]	2									
China:																		
Amoy	C	[illegible]		1			1			[illegible]	[illegible]		[illegible]					
Canton	C	[illegible]		7	6	2	1	4		[illegible]								
Dairen	C		2	4	1	2												
Foochow	C	P	P	P	P		P		P		[illegible]						1	
Hangchow	C					1	2											
Hankow	C	[illegible]	[illegible]	[illegible]	15	2	2	6	[illegible]	[illegible]	[illegible]	4	[illegible]					
Hong Kong	C	[illegible]	2	[illegible]	9	6	3	2	[illegible]	[illegible]	[illegible]	[illegible]	3					
Macao	D	3	43	47	53	7	5	[illegible]	1	2	1	1				[illegible]		
Nanking	C		2	1	1		1	[illegible]	[illegible]						[illegible]	[illegible]		
Shanghai	C	[illegible]	6		4	1		[illegible]	[illegible]	3	1		1	1	[illegible]		4	3
Swatow	C				1				1	[illegible]								

[illegible]	C																	
Tsingtao	C	3	2	11	17	3	7	1	5		4	7		2				
Chosen. (See table below.)																		
Colombia	C			11	23		5		2	1	12	4	1	8	2	24		
Barranquilla	C														1			
Bogota	C														1			
Dahomey. (See table below.)																		
Dutch East Indies: Balei	C			4														
Egypt:																		
Dakahliya	C				57	1			2	1		2	15	3	13			
Gharbiya	C					3												
Suez	C					[2] 1												
Provinces	C	3	2	4	3	6		6	9							1		
Eritrea	C							1	3	1								
Finland. (See table below.)																		
Formosa	C			P														
France. (See table below.)																		
French Somaliland	C			11	16	2	6	5		1	1							
Great Britain: England and Wales	C	1																
Greece: Salonika	C			1	2	1	1	1	1	1	1							
Guatemala. (See table below.)																		
Honduras: Tela	C		7	2	8								6					
India	C	7,163	[illegible]	[illegible]	31,533	8,164	8,745	9,173	[illegible]	[illegible]	12,623	11,070	10,548	11,012				
	D	1,431	[illegible]	[illegible]	6,726	1,648	[illegible]	1,291	1,753	2,416	2,528	2,151	2,385	2,543				
Assam	C			27	27	9	12	6	3	17	13	4	4	11	10	6	6	54
Bassein	C			1											[2] 1			
	D			2														
Bombay Presidency	C	1,245	[illegible]	4,816	7,778	2,222	2,128	[illegible]	[illegible]	2,534	[illegible]	[illegible]	2,231	[illegible]	[illegible]	[illegible]	[illegible]	
	D	204	[illegible]	[illegible]	1,445	412	427	[illegible]	[illegible]	531	741	[illegible]	[illegible]	[illegible]	414	[illegible]	[illegible]	
Bombay	C	5	[illegible]	[illegible]	235	59	81	91	[illegible]	119	[illegible]	111	119	[illegible]	75	51	[illegible]	[illegible]
	D	4	[illegible]	41	114	25	44	60	57	73	[illegible]	65	53	72	44	46	41	[illegible]
Calcutta	C	4	[illegible]	79	170	58	62	74	[illegible]	149	125	[illegible]	104	152	[illegible]	51	62	35
	D	1	[illegible]	[illegible]	103	34	47	47	53	[illegible]	110	43	69	104	[illegible]	[illegible]	45	[illegible]
Chittagong	C				[2] 1	[2] 2												
Cochin	C			2	6			3	1	1	2							
Karachi	C		7	11	52	[illegible]	[illegible]	[illegible]	11	2	12	10	10	11	[illegible]	3	11	6
Madras Presidency	C	[illegible]	[illegible]	[illegible]	[illegible]	1,246	[illegible]	1,149	[illegible]	[illegible]	[illegible]	1,103	852	1,022				
	D	442	[illegible]	[illegible]	[illegible]	150	[illegible]	[illegible]	21	[illegible]	[illegible]	[illegible]	189	[illegible]				
Madras	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	17	[illegible]	7	19	15	[illegible]	5	9	[illegible]	5	5	[illegible]
Moulmein	C				[2] 1				1	1								1
Negapatam	C	3	[illegible]	[illegible]	43	12	21	[illegible]	[illegible]	11	[illegible]	10	2	[illegible]	[illegible]	1	[illegible]	3
Punjab	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	31	31	41	[illegible]	65	[illegible]	[illegible]
Rangoon	C	3		[illegible]	77	43	[illegible]	24	[illegible]	[illegible]	[illegible]	15	25	[illegible]	[illegible]	[illegible]	[illegible]	7
Tuticorin	C			4						1		[illegible]					[illegible]	
Vizagapatam	C	[illegible]	[illegible]	62	[illegible]	[illegible]	21	21	[illegible]	30	42	27	[illegible]	32	[illegible]	19	[illegible]	[illegible]
India (French):																		
Chandernagor	C				1	2				4	14		3	2				
Karikal	C	1	[illegible]	14	11	4	1		[illegible]	4	7	11	5	9				
Mahe	D	3																
Pondichery	C	[illegible]	[illegible]	[illegible]	[illegible]	17	13	23	32	[illegible]	[illegible]	31	[illegible]	25				
	D	45	[illegible]	[illegible]	72	16	13	[illegible]	[illegible]	[illegible]	15	24	15	24				

[1] For 2 weeks.

[2] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Dec. 30, 1934–Jan. 26, 1935	Jan. 27–Feb. 23, 1935	Week ended— March 1935 2	9	16	23	30	April 1935 6	13	20	27	May 1935 4	11	18	25
Indo-China (see also table below):																		
Haiphong	C			1			1	2				1	2	[illegible]	2	2	1	2
Pnom Penh	C						3	1	1	5								
Tourane	C	3	5	2	5		4	2										
Iran	C	4	1	4	[illegible]			1						[illegible]				
Teheran	C	2	2															
	D	1																
Iraq	C	[illegible]	53	34	7		5	1	2		[illegible]	6	[illegible]					
Arbil	C		[illegible]	1	4							2						
Basra	C		6									1	1					
Mosul liwa	C			9		6		1	2			1	1					
Japan (see also table below)	C	[illegible]	[illegible]41															
Kobe	C				1													
Nagasaki	C				1	3												
Osaka	C																	
Taiwan	D		2															
Lithuania. (See table below.)																		
Mexico:																		
Allende.[2]																		
Chihuahua	C	2	17	7	8	3			[illegible]		[illegible]			[illegible]			[illegible]	
Guadalajara	D																	1
Mazatlan	C																	
Mexico, D. F.	C		7	37	103	[illegible]	[illegible]	[illegible]	[illegible]									
Monterrey	C					[illegible]												
San Luis Potosi	D		1															
Vera Cruz	C								[illegible]									
Morocco. (See table below.)																		
Mozambique. (See table below.)																		
Nigeria	C	115	[illegible]	[illegible]	372	[illegible]	50		56	244			24					
Lagos	C				1													
Nyasaland. (See table below.)																		
Palestine	C		1	2	4				2							1		2
Peru. (See table below.)																		
Poland	C	1								1								

Portugal (see also table below):																		
Lisbon	C	2	1			3		1	1		1	1						
Oporto	C	1	1												1			
Portuguese East Africa. (See table below.)																		
Salvador	C	10	28	88	74													
Saudi Arabia	C								[4] 24	24					19			
Siam	C	13	20	24	2													
Bangkok	C			1	1													
Sierra Leone	C	[1] 60	172	111	265	[1] 95		[1] 19		[1] 9		[1] 10		[1] 177		[illegible]		
Spain	C	165	73	16	15	13		4	9	8	6	3	16	11	[illegible]	[illegible]	3	
Straits Settlements: Singapore	C													[illegible]			[illegible]	1
Sudan (Anglo-Egyptian)	C		12	13	9			4	1	3	12	1	8	2	[illegible]	[illegible]	2	2
Syria:																		
Damascus	C	33	45	6	2													
Provinces	C	116	114	22	4		2							[illegible]				
Trans-Jordan	C	[2] 1																
Tunisia	C			5													1	
Turkey. (See table below.)																		
Union of Soviet Socialist Republics. (See table below.)																		

[1] For 2 weeks.
[2] Imported.
[3] A report dated Dec. 28, 1934, states that about 45 cases of smallpox with 5 or 6 deaths had been reported at Allende, Mexico.
[4] For 3 weeks.

On vessels:

S. S. *Kwang-Si* at Jibuti	1 case	Nov. 24, 1934
S. S. *Varela* at Basra	1 case	Dec. [illegible], 1934
S. S. *Talma* at Hong Kong	1 case	Jan. 19, 1935
S. S. *Chilka* at Rangoon from Gopalpore	1 case	Jan. 23, 1935
S. S. *Aorangi* at Sydney from Vancouver	1 case	Jan. 24, 1935
S. S. *Hosang* at Singapore from Osaka	1 case	Feb. 2, 1935
S. S. *Rhona* at Port Swettenham from Madras	1 case	Feb. 22, 1935
S. S. *Mongolia* at Suez from Australia	1 case	Feb. 24, 1935
S. S. *Elenga* at Rangoon	1 case	Feb. 26, 1935
S. S. *Suisang* at Singapore from Hong Kong	1 case	Feb. [illegible], 1935
S. S. *Empress of Britain* at Singapore from Bombay	1 case	Mar. 5, 1935
S. S. *Cremer* at Singapore from Amoy	1 case	Mar. [illegible], 1935
S. S. *Kutsang* at Hong Kong	1 case	Mar. [illegible], 1935
S. S. *Tatsuta Maru* at San Francisco	1 case	Mar. 14, 1935

On vessels:

S. S. *[illegible] Maru* at San Francisco	[illegible]	[illegible]
S. S. *[illegible]* at Port Said from [illegible]	[illegible]	[illegible]
S. S. *[illegible]* at Singapore from Hong Kong	[illegible]	[illegible]
S. S. *[illegible]* at Singapore from Amoy	[illegible]	[illegible]
S. S. *[illegible]* at Aden	[illegible]	[illegible]
S. S. *[illegible]* at [illegible] from Hong Kong	[illegible]	[illegible]
S. S. *[illegible]* at Karachi	[illegible]	[illegible]
S. S. *[illegible] Maru* at [illegible]	[illegible]	[illegible]
S. S. *[illegible]* at [illegible]	[illegible]	[illegible]
S. S. *[illegible]* at [illegible]	[illegible]	[illegible]
S. S. *[illegible]* at [illegible]	[illegible]	[illegible]
S. S. *[illegible]* at [illegible]	[illegible]	[illegible]
S. S. *[illegible]* at Singapore from Hong Kong	[illegible]	[illegible]
S. S. *[illegible]* at [illegible]	[illegible]	[illegible]

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		November 1934	December 1934	January 1935	February 1935	March 1935	April 1935
Belgian Congo (see also table above)	C	110		109	58	95	
Bolivia	C	53	35	52	42	42	86
Chosen	C	38	15	153	175	175	
Dahomey	C	1		3	4	16	
Finland	C						1
France	C	53	57	21	17	78	5
Guatemala	C	1	2		2	1	
Indo-China (see also table above)	C	250	257	675	582	601	552
	D	22	[illegible]	67	69	53	62
Japan (see also table above)	C			22	5		

Place		November 1934	December 1934	January 1935	February 1935	March 1935	April 1935
Lithuania	C		1				
Morocco	C	7	[illegible]			[illegible]	5
Mozambique	C	[illegible]		[illegible]			
Nyasaland	C	24	15		[illegible]	[illegible]	
Peru	C		[illegible]	[illegible]	[illegible]	1	
Portugal (see also table above)	C	173	[illegible]	[illegible]	[illegible]	4	
	D	27	1	4		2	
Portuguese East Africa	C	[illegible]					
Turkey	C	2	[illegible]	[illegible]	[illegible]	[illegible]	1
Union of Soviet Socialist Republics	C	355	272				

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 22, 1934	Dec. 23, 1934–Jan. 26, 1935	Week ended— February 1935: 2	9	16	23	March 1935: 2	[illegible]	16	23	[illegible]	April 1935: [illegible]	[illegible]	[illegible]	[illegible]	May 1935: 4	11	18
Algeria:																				
Algiers Department	C	4	[illegible]	5	1				[illegible]			8	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Constantine Department	C		24	12	3	11	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5	[illegible]
Bone	C			2																
Constantine	C	[illegible]	1	1		[illegible]	1	[illegible]		1	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]				
Oran Department	C		[illegible]										[illegible]	[illegible]						2
Southern Territories	C								[illegible]				[illegible]	[illegible]						2
Basutoland	C	26	3	5								2	3	[illegible]		[illegible]			6	
Belgian Congo	C	[illegible]	4	4							1									
Bolivia. (See table below.)																				
British East Africa, Uganda	C	[illegible]	[illegible]			4			[illegible]											

Bulgaria	C	7	12	10	1						1	3	3	2						
Chile	C	1,642	1,663	275																
Concepcion	C		[illegible]							8										
Iquique[1]																				
Santiago	C		[illegible]							18										
Valparaiso	C	23	[illegible]	[illegible]	5	1		1		2	1		2		2	1		4		
China:																				
Hangchow	C										1									
Nanking	C										1							1		
Shanghai	C		4							1	2									
Tientsin	C			[illegible]																
Tsingtao	C														2					
Chosen. (See table below.)																				
Colombia	D			1																
Czechoslovakia. (See table below																				
Egypt:																				
Alexandria	C		[illegible]	1		1	2	2	3	1	3			5	4	4	8	4	4	4
Aswan	C	2	[illegible]							9	7	7	1		2	[illegible]	3	16	17	7
Asyut	C						1				4	6	1				1			
Beheira	C		[illegible]	[illegible]	44	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	50	[illegible]	[illegible]	72	[illegible]	[illegible]	[illegible]	41	45
Beni-Suef	C					3					2				1				1	
Cairo	C	1	[illegible]	1			[illegible]	4	2			3			[illegible]	1	1		1	2
Dakahliya	C	1		[illegible]	3	15	44	46	[illegible]	[illegible]	12	6	6	5	[illegible]	3		1	2	
Damietta	D		[illegible]																	
Gharbiya	C	6	6	[illegible]	[illegible]	41	[illegible]	[illegible]	61	40	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		45	51
Girga	C			1									7		1	1				
Minufiya	C	[illegible]		3	4	7	9	13	7	10	16	15	[illegible]	27	[illegible]	[illegible]	[illegible]	9	13	11
Minya	C												1	1	1	1	1	2		2
Port Said	C	2			1							1	1						[illegible]	
Qena	C	1								1		1	2					1		2
Sharkiya	C		[illegible]		4	7	12	[illegible]	7	4	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	2	6		
Suez	C												1							
Provinces	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	125	131
Greece (see also table below) [illegible]	C	4	5																	
Guatemala. (See table below.																				
Hungary	C		5	1			1								4					13
Indo-China. See table below																				
Iran	C	[illegible]	[illegible]	[illegible]	12	8	15	[illegible]	[illegible]	[illegible]	[illegible]	15	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	53	
Teheran	C			1							3		1	1				1	6	
Iraq:																				
Baghdad	C		[illegible]																	
Sulaimaniya	C														1	19	[illegible]	[illegible]	1	
Irish Free State: Cork County—																				
Castletown	C									1										1
Latvia. See table below.																				
Libya: Tripolitania	C					2			2		2									
Lithuania	C	[illegible]	[illegible]	[illegible]	7	14	6	13	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7		[illegible]	17	2	[illegible]	14
Mexico (see also table below):																				
Mexico, D. F.	C		[illegible]	61	13	8	[illegible]	10	[illegible]	[illegible]	[illegible]	11	[illegible]	18	17					
Progreso	D											1								
Torreon	C	[illegible]	2				1													

[1] For the week ended May 9, 1935, [illegible] cases of typhus fever were reported at San Jose nitrate camp about 42 miles from Iquique, Chile.

[2] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Dec. 30, 1934–Jan. 26, 1935	Week ended— February 1935: 2	9	16	23	March 1935: 2	9	16	23	30	April 1935: 6	13	20	27	May 1935: 4	11	18
Morocco	C	1	17	7		4	6	14	4	5	8	8		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	21
Palestine	C			2																
Haifa	C	4	4				1	1			1				1	1			1	
Jaffa	C		1	2											1				4	1
Panama Canal Zone. (See table below.)																				
Peru. (See table below.)																				
Poland	C	61	124	169	69	82	57	53	84	[illegible]	[illegible]	[illegible]	136	163	[illegible]	[illegible]	[illegible]	[illegible]	174	139
	D	9	10	17	4	3	5	6	[illegible]	11	[illegible]	[illegible]	8	5	8	[illegible]	[illegible]	9	12	14
Portugal (see also table below):																				
Oporto	C		2																	
Tarouca (near)	C			[illegible]																
Rumania. (See table below.)																				
Saudi Arabia	C																	[illegible]		
Straits Settlements: Singapore	C			1				2				1			1		[illegible]	1		
Syria	C				1															
Trans-Jordan	C						2			[illegible]	[illegible]			1	3	4	[illegible]	[illegible]	[illegible]	2
Tunisia:																				
Tunis	C	[illegible]	4							[illegible]			2	5	[illegible]	[illegible]	[illegible]	1	5	3
Provinces	C	[illegible]	[illegible]	[illegible]	10	14	[illegible]	[illegible]	7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	24	42
Turkey. (See table below.)																				
Union of South Africa. (See table below.)																				
Union of Soviet Socialist Republics. (See table below.)																				
Yugoslavia. (See table below.)																				
On vessel: S.S. [illegible] at San Francisco	C												1							

[1] For 3 weeks.

Place		November 1934	December 1934	January 1935	February 1935	March 1935	April 1935	Place	November 1934	December 1934	January 1935	February 1935	March 1935	April 1935
[illegible]	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Greece	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Guatemala	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Indo-China (French)	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Latvia	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mexico (see also [illegible])	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Panama Canal Zone	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Peru	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.4

YELLOW FEVER

[illegible]

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		Oct. 28–Nov. 24, 1934	Nov. 25–Dec. 29, 1934	Dec. 30, 1934–Jan. 26, 1935	Week ended— February 1935 2	9	16	23	March 1935 2	9	16	23	30	April 1935 6	13	20	27	May 1935 4	11
Gold Coast:																			
Aperadi	C			3															
	D			1															
Kokobee	C	1																	
Oda	C			1															
Wenchi	C	1																	
Ivory Coast:																			
Banguoanou	C				1														
Bassam (near)	C																		
Bobo-Dioulasso	C																		
Dimbokro	C			1															
Gagnoa																			
Ouagadougou																			
Toumodi																			
Zuenoula																			
Nigeria: Kano				1															
Niger Territory: Zinder				1															
Sierra Leone:																			
Freetown																			
Hill Station (near Freetown)	C			1															
Togo:																			
Agoueve	C																		1
Kouniea	C																		1
Sokode[4]																			

[4] During the week ended May 25, 1935, 1 case of yellow fever with 1 death was reported at Sokode, Togo.